

VOL. XLV. No.8

AUGUST 1960

MECCANO

MAGAZINE



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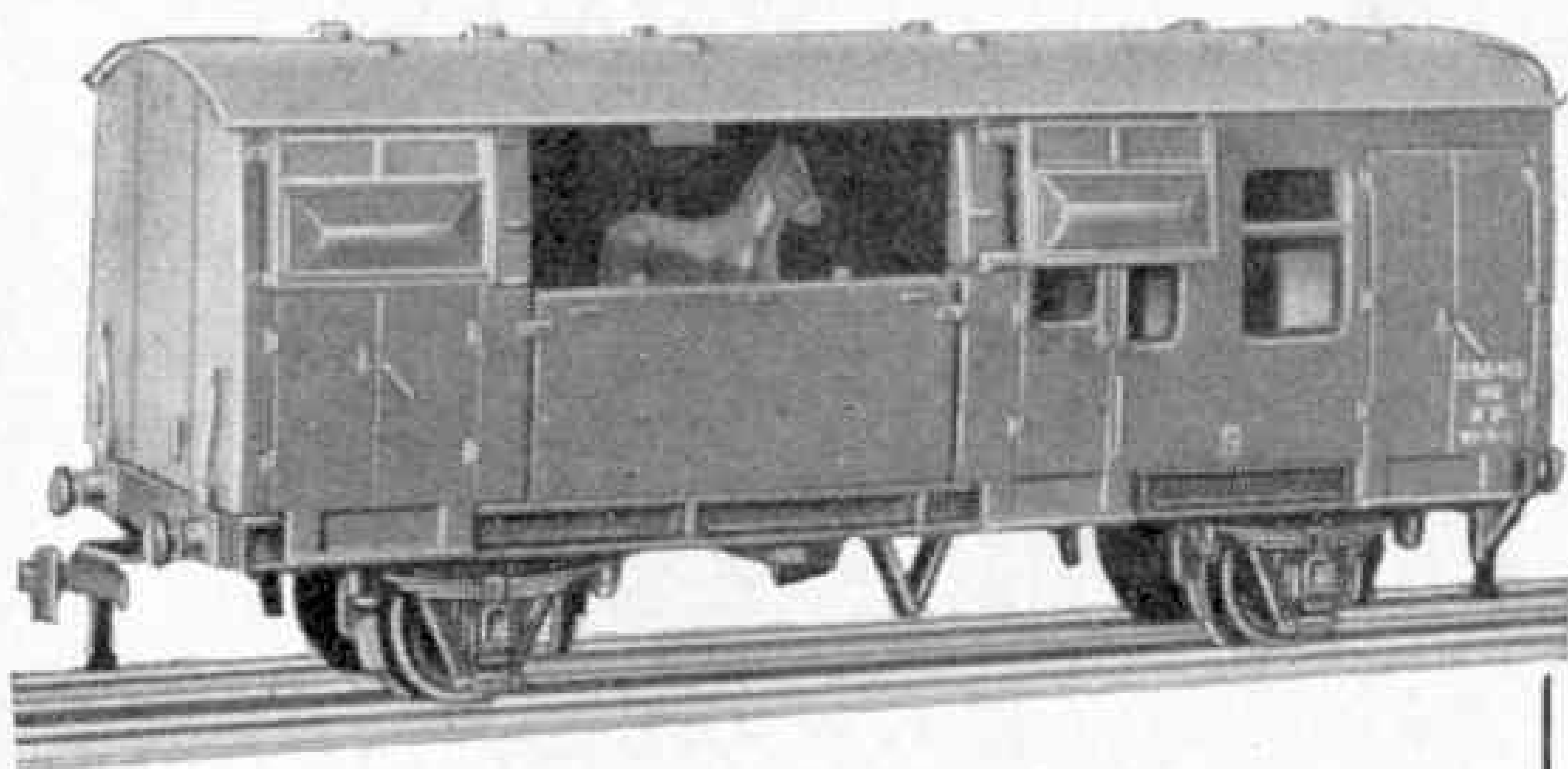
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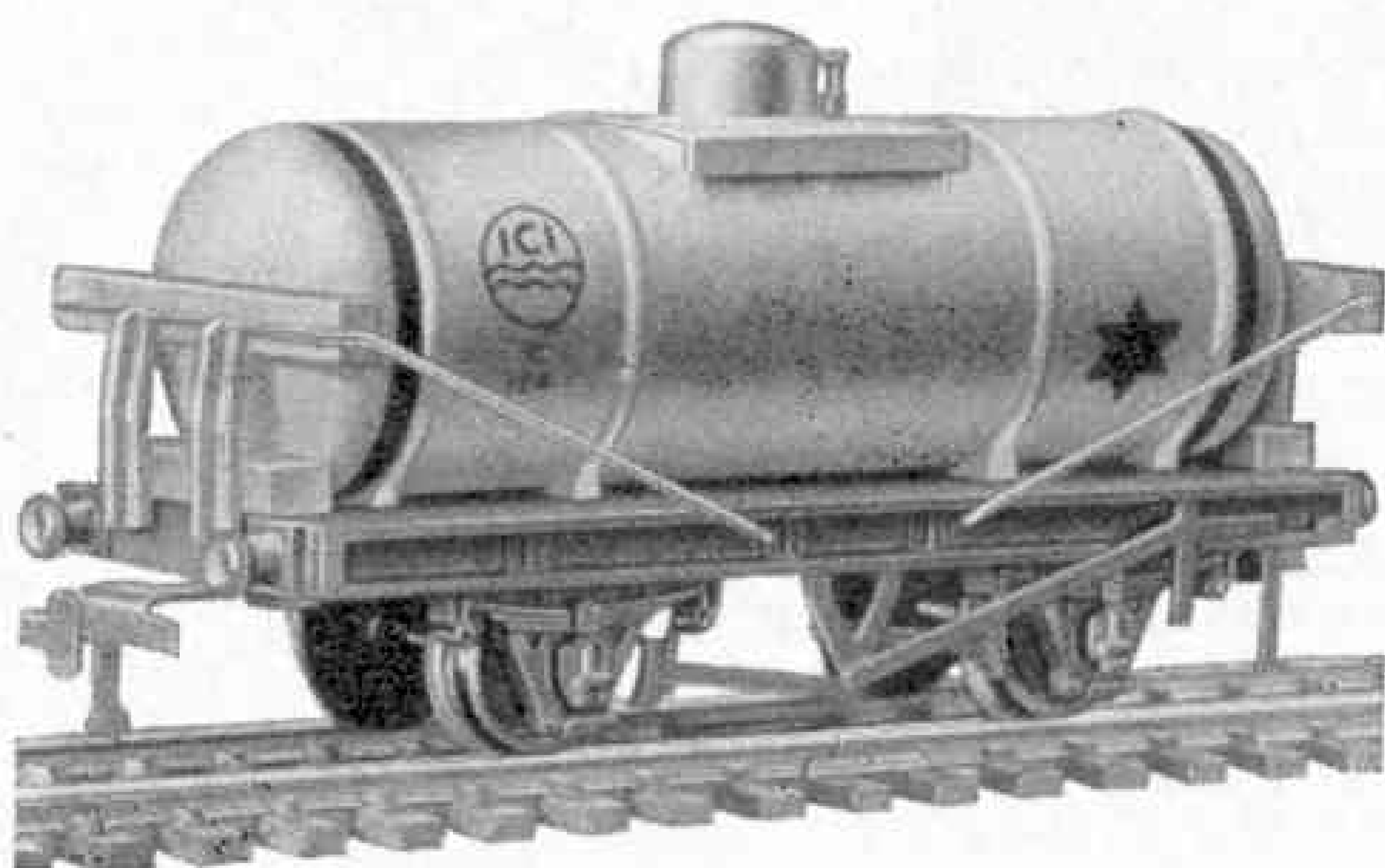
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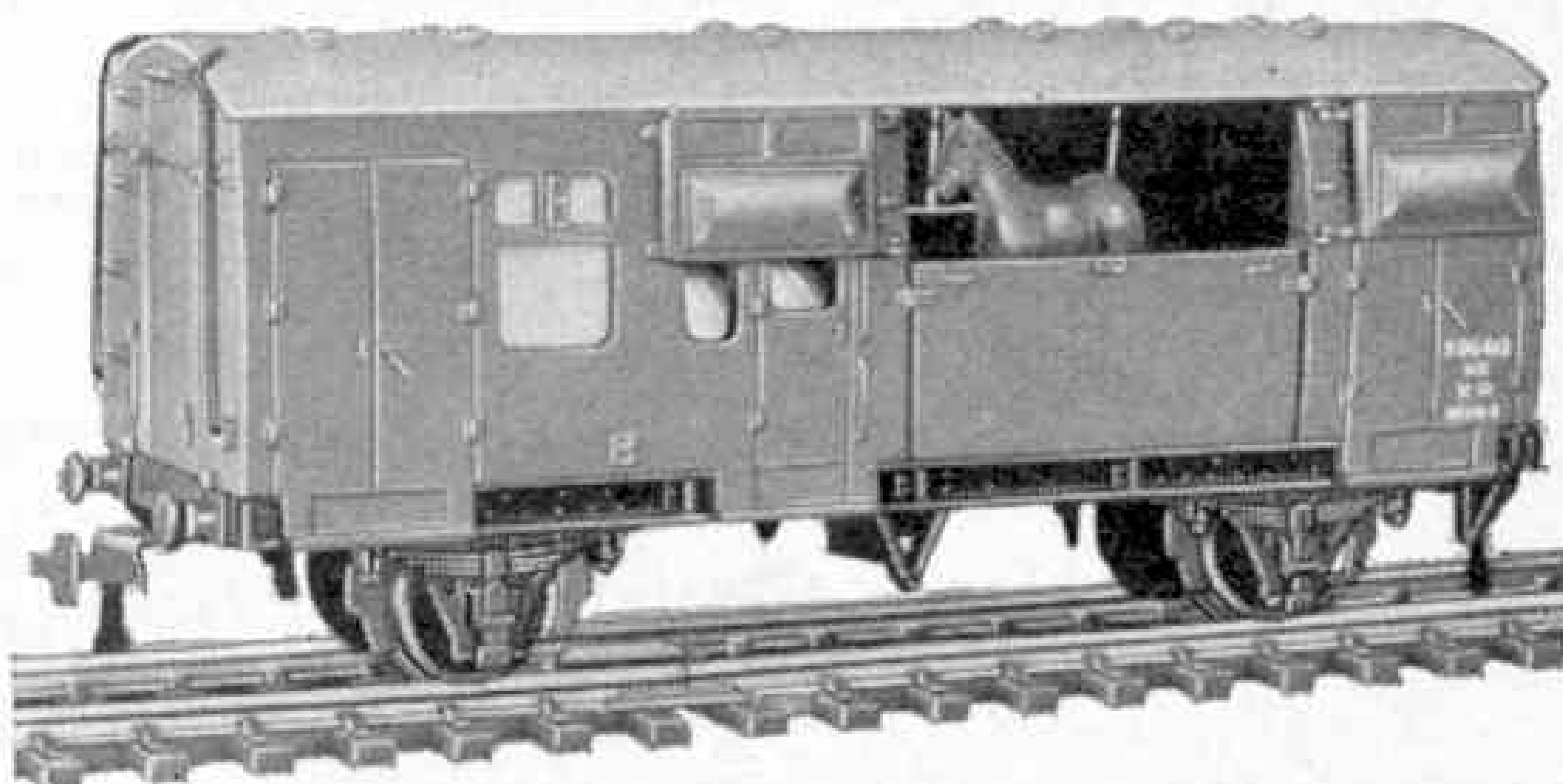
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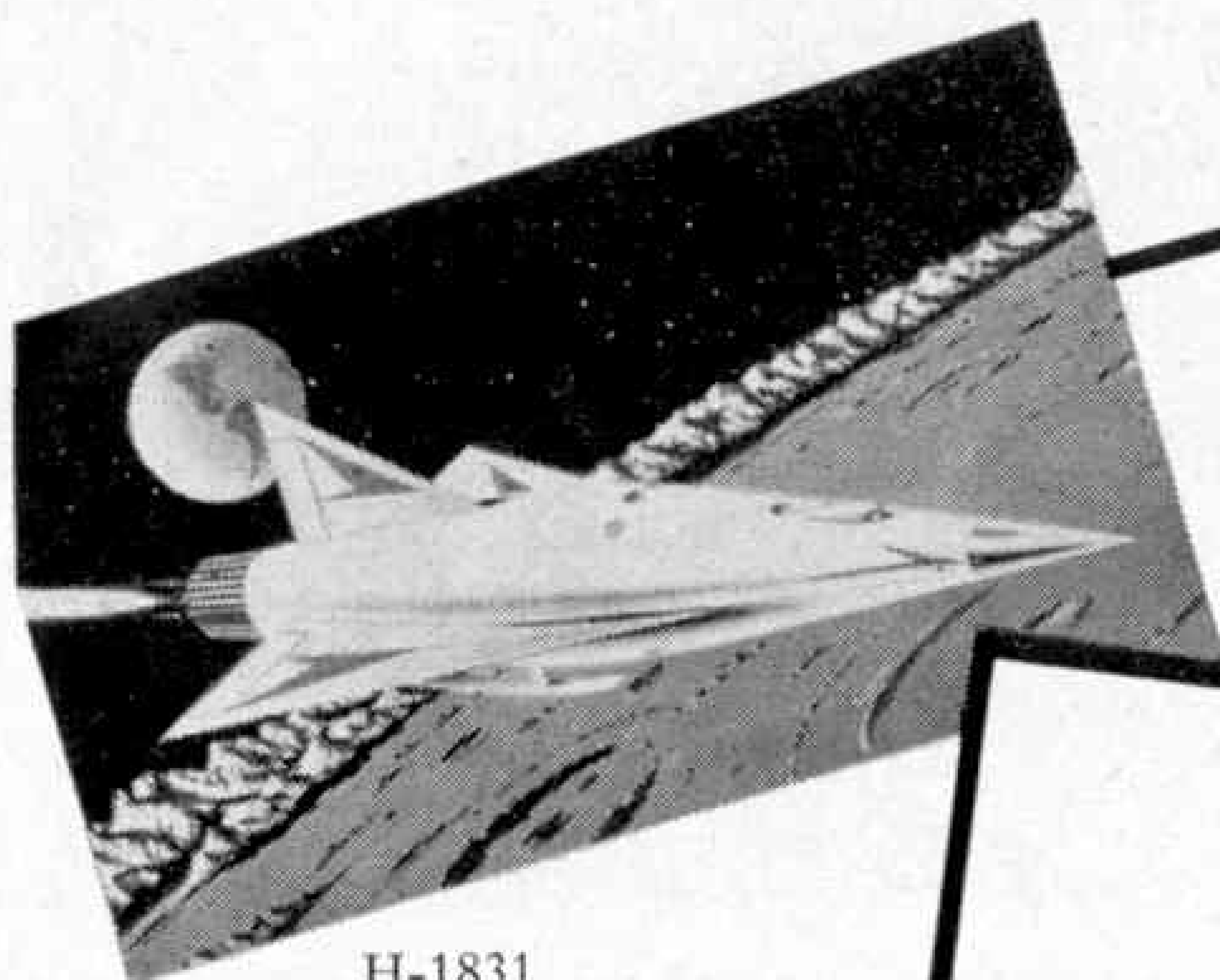
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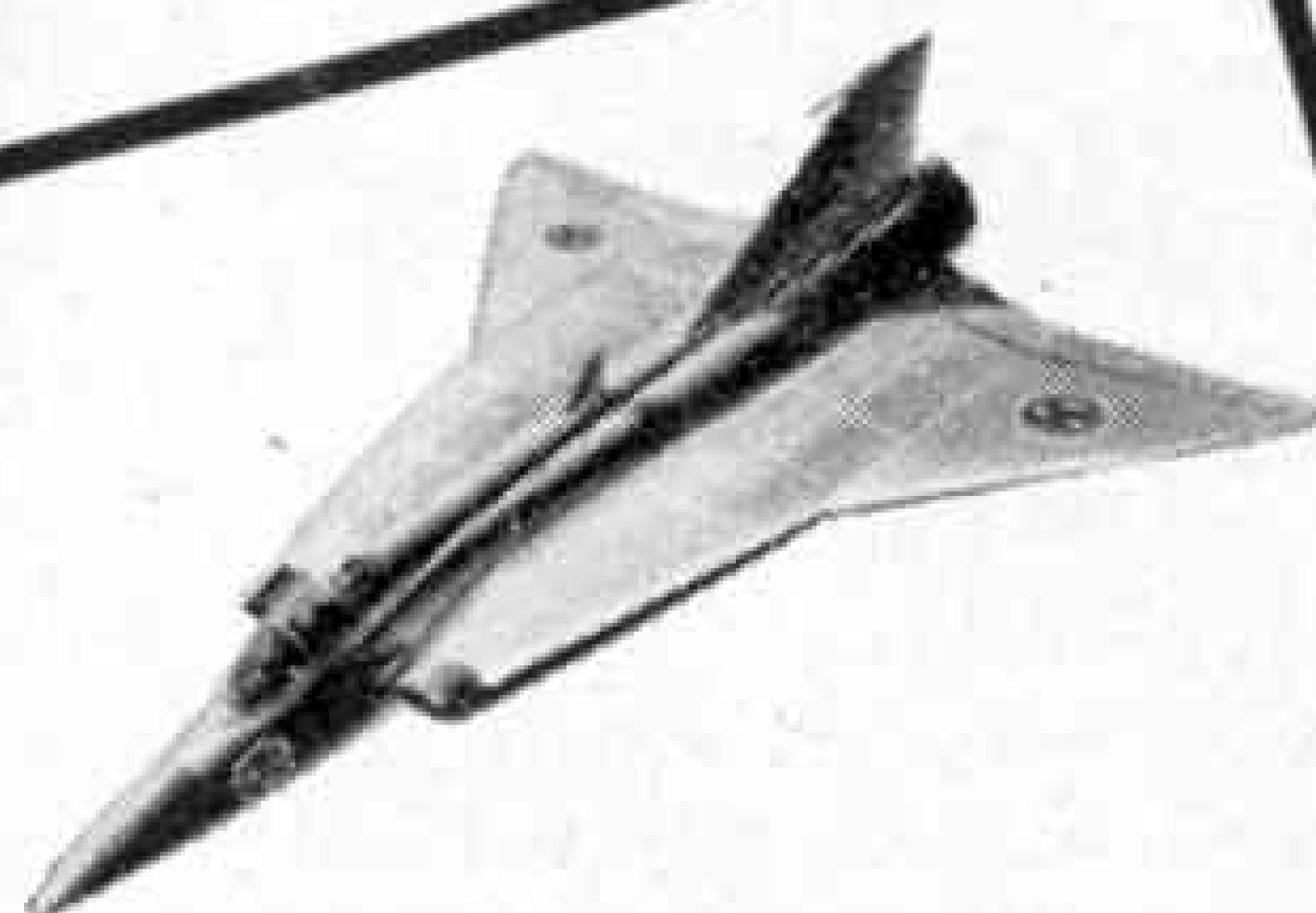
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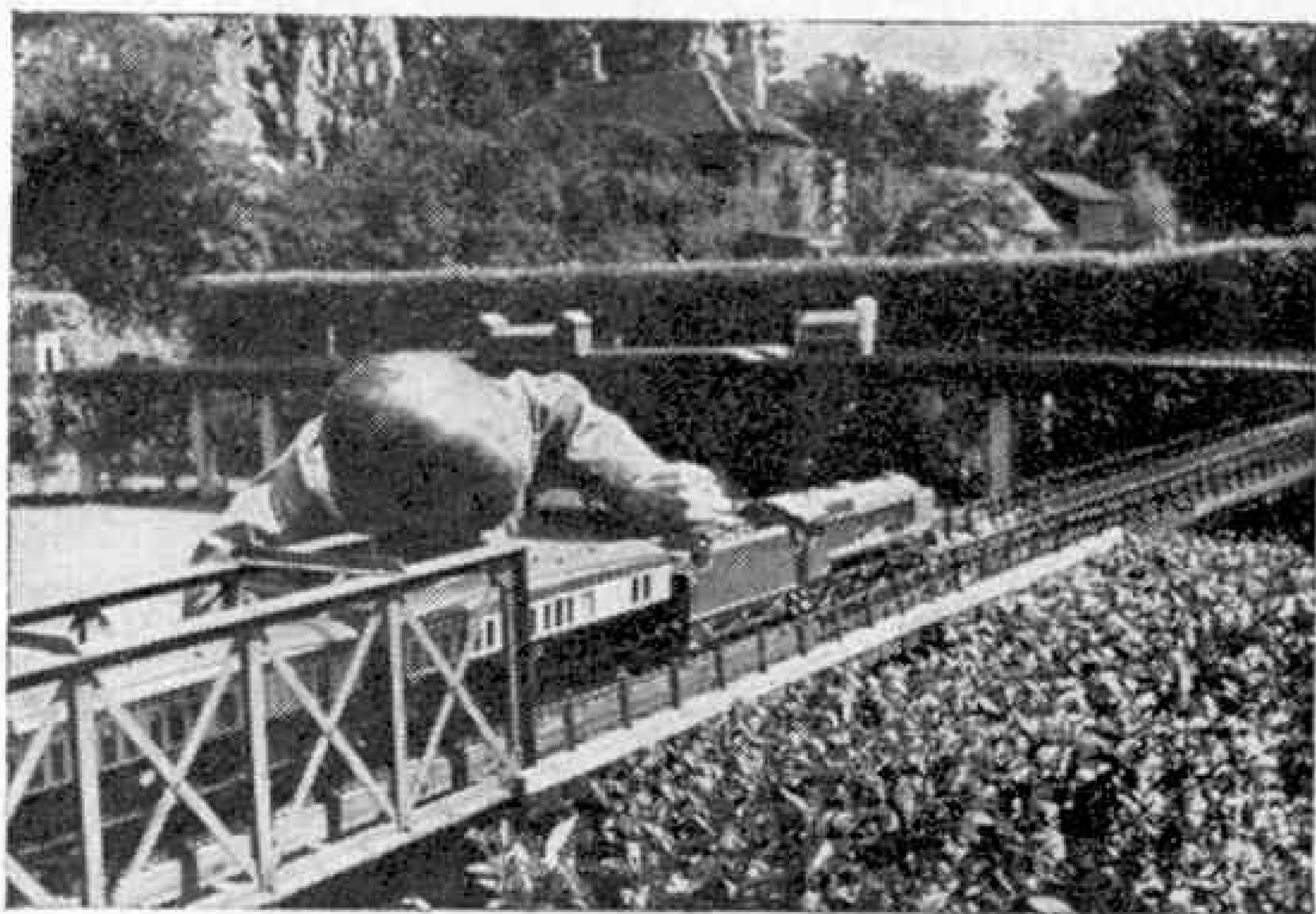
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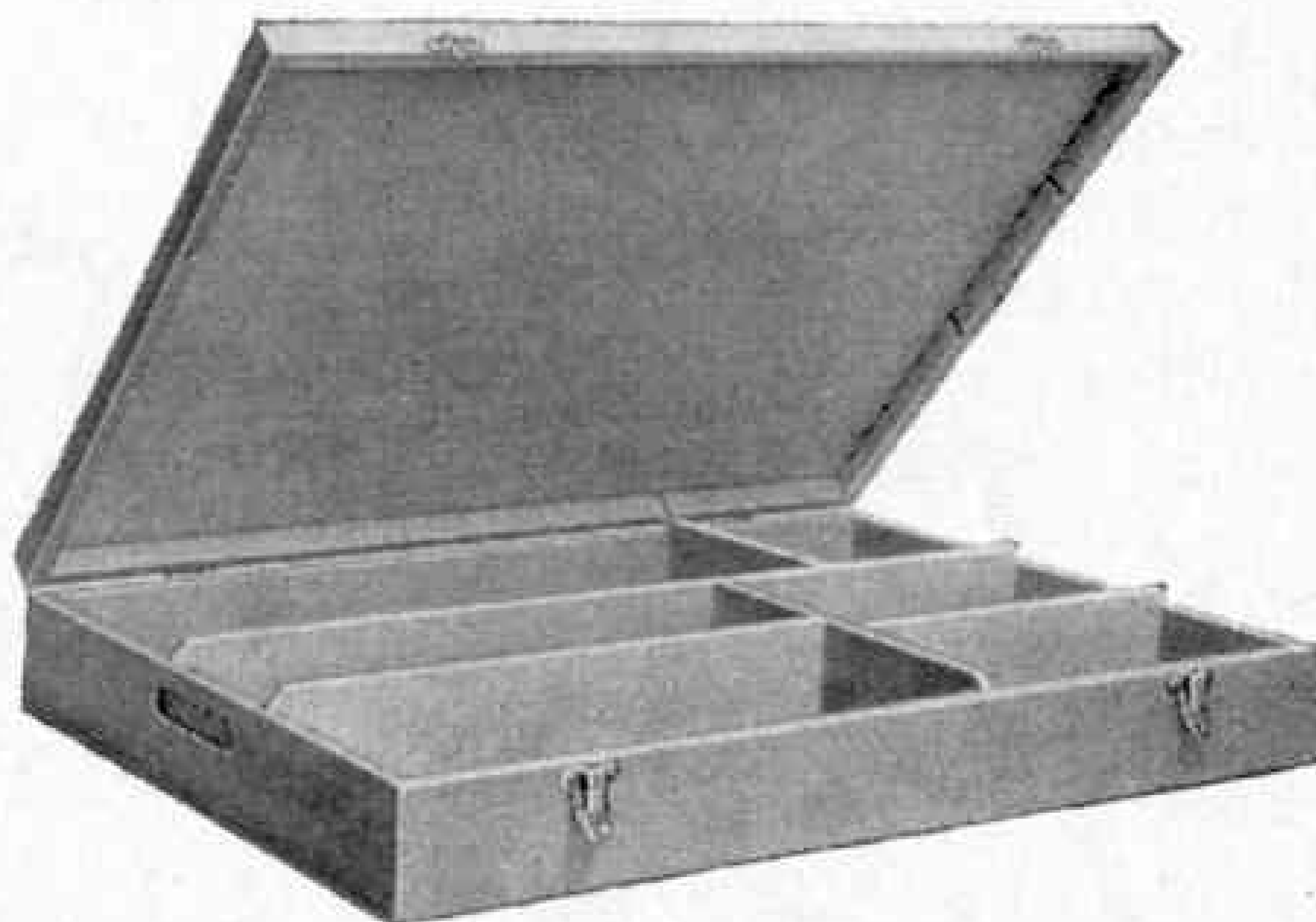


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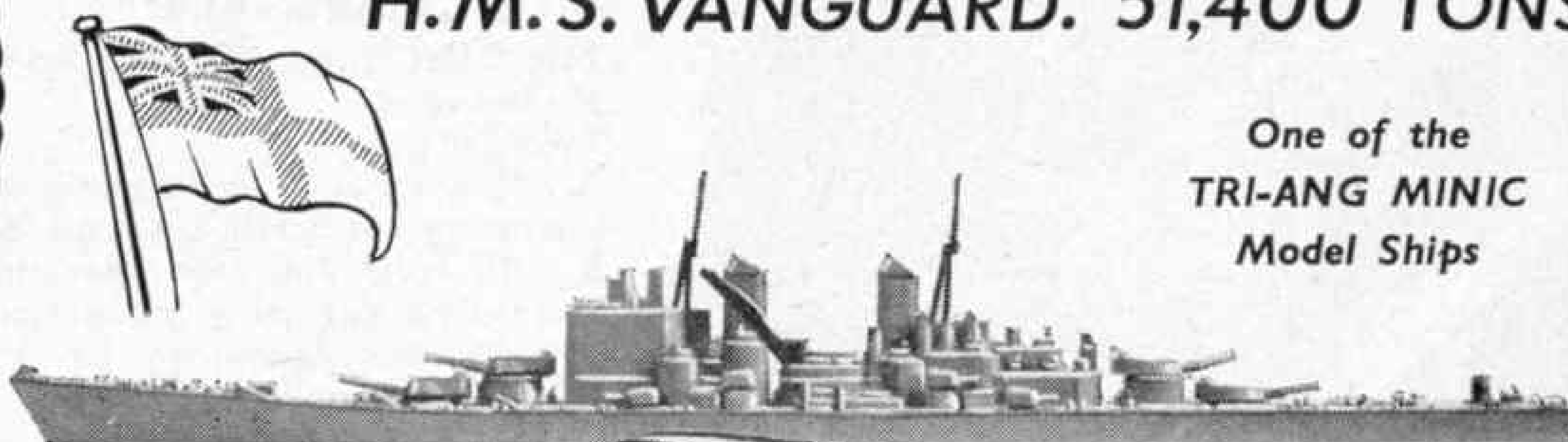
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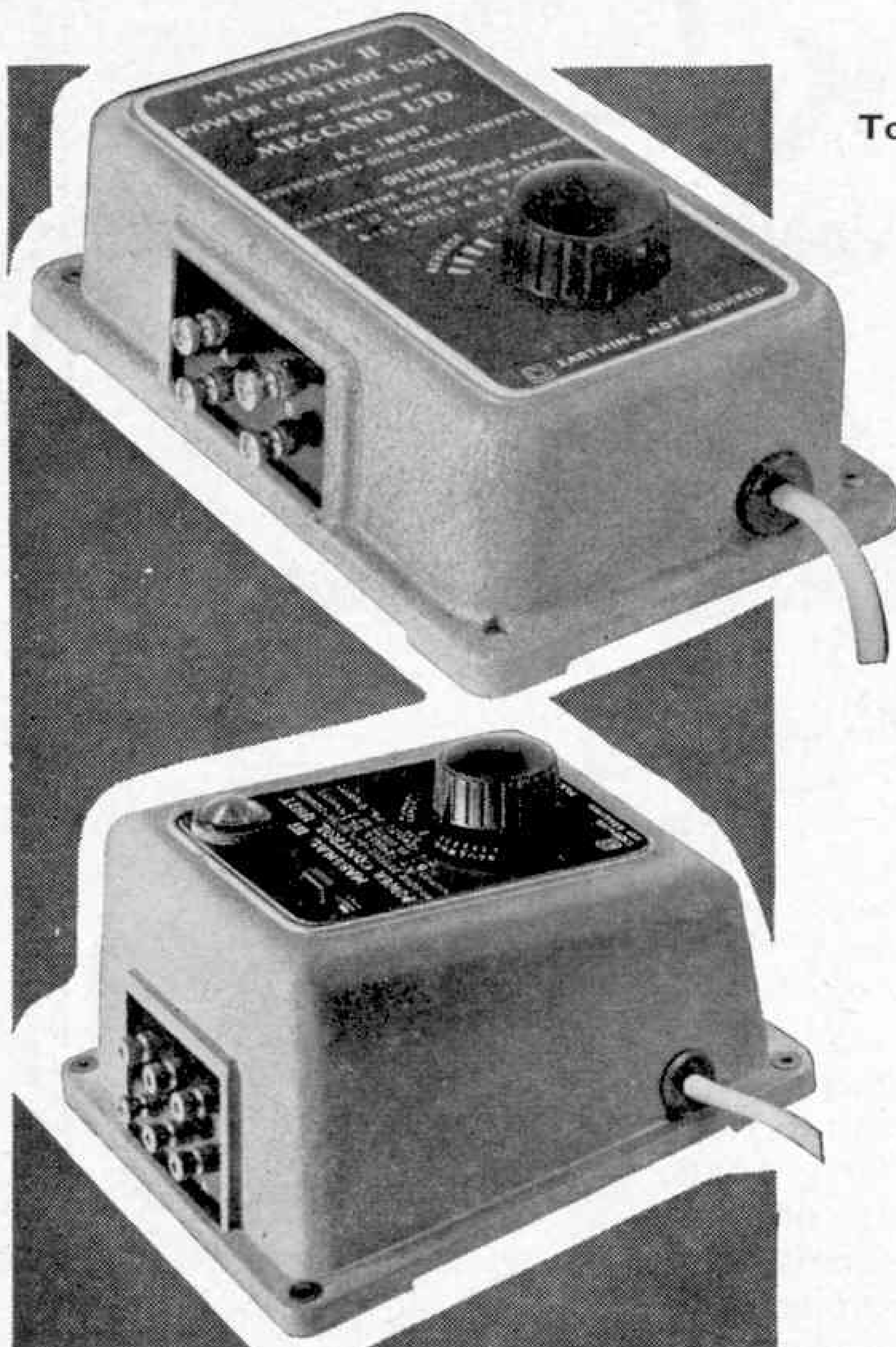
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MAGAZINE

Editorial Office:
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EDITOR: GEOFFREY BYROM
ASST. EDITOR: ERNEST MILLER

Vol. XLV
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August 1960

Taking Pride in One's Progress

THE County Borough of Wallasey, across the Mersey from Liverpool, is celebrating its Charter Jubilee Year. Recent events to mark the town's 50 years of progress included an exhibition at the Town Hall, and when I visited this splendid show I was fascinated by the improvements over the past half century in all forms of public services, particularly transport. It was extremely interesting to see photographs and drawings of old trams and buses which used to carry Wallaseyans on their various peregrinations, and it brought home the fact that—if one may be pardoned the phrase—movement in transport is constant.

Yet, while much has been done to increase comfort for the traveller, speeds—particularly so far as trains are concerned—have not greatly increased over the years. Perhaps the days of electrification will usher in a speedier era.

Another aspect which struck me about the Wallasey exhibition was the town's obvious pride in its achievements. Civic pride, I know, is one thing, and personal pride or egotism quite another, but there is nothing wrong in being proud of one's achievements. I

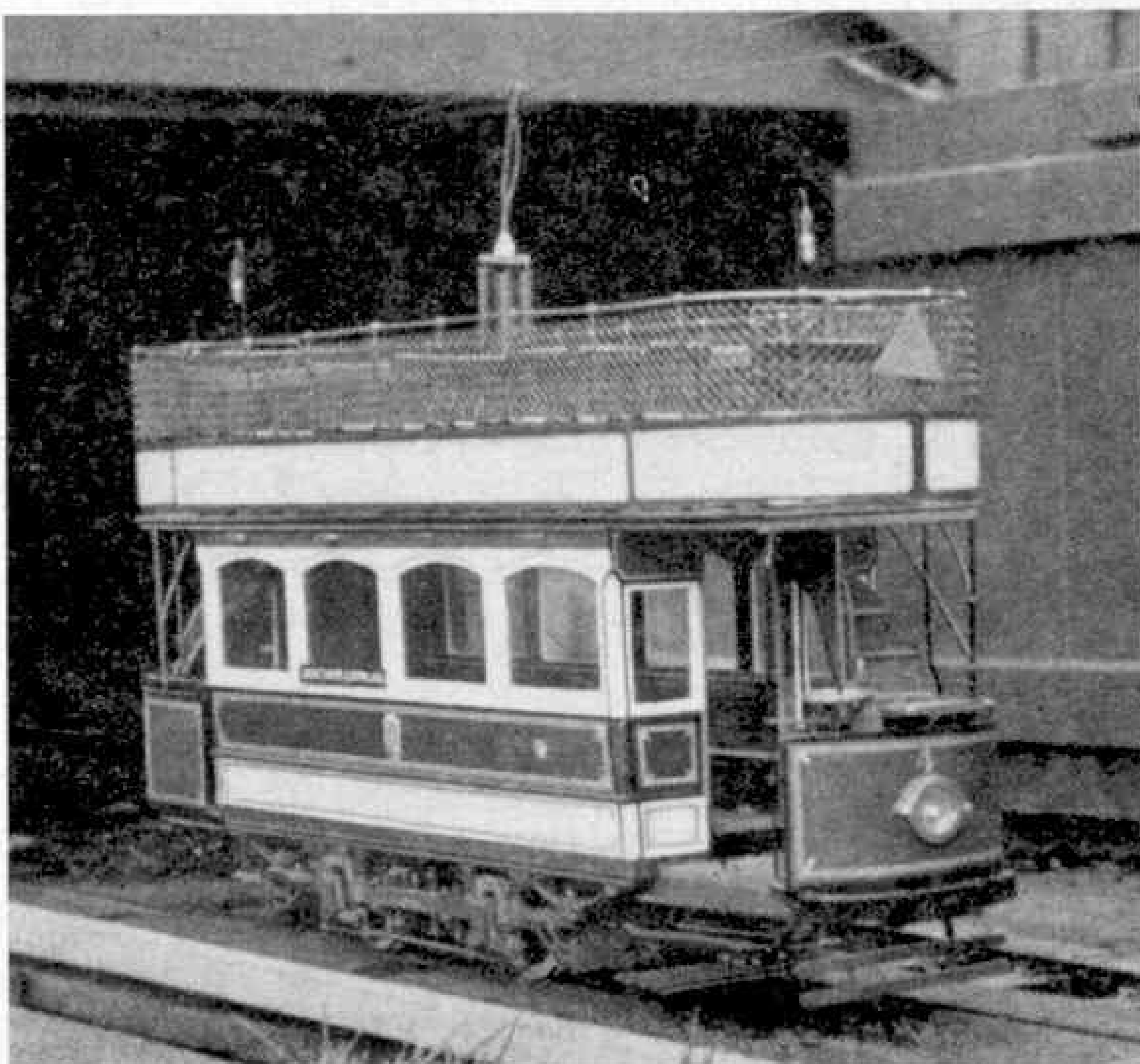
always feel that boys interested in the engineering and miniature railway hobbies fostered by Meccano Ltd. have at their fingertips the key to personal achievements of a quite high order. With both they can build and re-build, improvise and improve. There is always a challenge ahead of them and that is a fine thing, for every challenge in life is there to be answered.

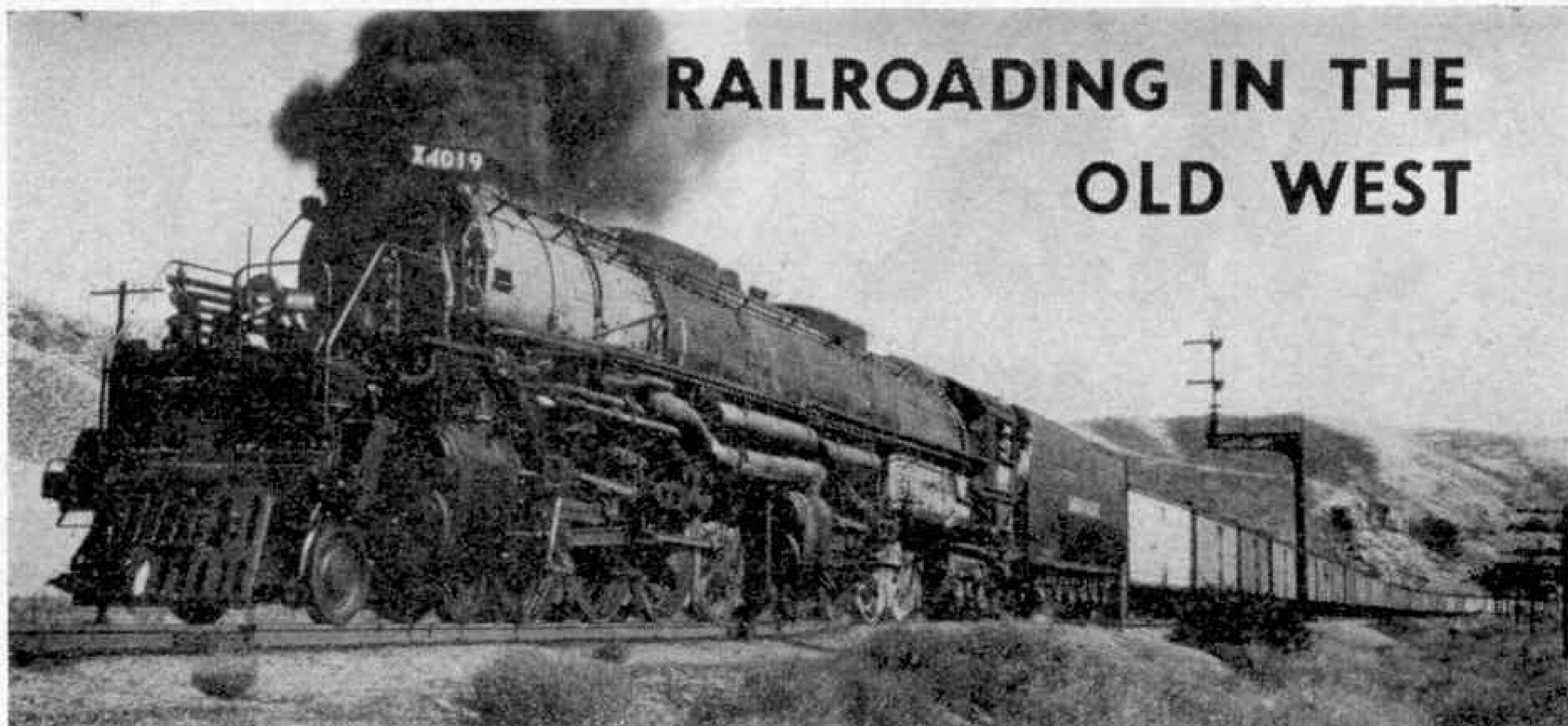
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My comments last month about the questionnaire have brought more replies from our older readers, and I am grateful for them. I feel that readers' answers in general have now given me a very complete picture of their likes—and dislikes.

THE EDITOR

This model of an early type open-top tramcar will be on show at an exhibition at the Bishopsgate Institute, London, from 25th to 27th August. The exhibition, sponsored by the Tramway and Light Railway Society, commemorates the centenary of the street tramway in Britain. The first was constructed at Birkenhead, in 1860, by the American, George Francis Train.





RAILROADING IN THE OLD WEST

THE history of the railways of America is full of romance and excitement. Less than 100 years ago America's Wild West was even wilder than television and films would have us believe. Building and

By
H. G. Forsythe

operating a railway in those days was not only a great engineering feat but also an epic story of courage and achievement in the face of fantastic difficulties and dangers.

Perhaps most exciting of all is the story of the building of America's first trans-continental railway. For years men of vision had dreamed of constructing a railway right across the great continent of North America. In 1862, the dream became reality when President Lincoln signed the Pacific Railroad Bill authorising the Union Pacific and Central Pacific Railroads to go ahead.

The Union Pacific was to strike out westwards from Omaha on the Missouri River to meet the Central Pacific which would work inland from Sacramento. The government provided the companies with land grants and financial aid to the extent of £9,600 per mile over the mountain sections and £3,200 per mile elsewhere.

Begun during Civil War

Both companies started construction in 1863. At that time the American Civil War was raging in all its fury. Labour was very scarce and, at first, progress was slow. The route of the Union Pacific lay through the vast open spaces of the prairies, country which could provide no materials except ballast for the construction of the railway.

Modern railroading on the Union Pacific: A "Big Boy" 4-8-8-4, the biggest and most powerful steam locomotive in the world, heads a 3,000-ton freight train in the mountains. The photographs illustrating this article are by courtesy of the Union Pacific Railroad.

All supplies for the railway had to be brought from hundreds of miles away. Even sleepers were transported from far off and more than 350,000 tons of steel rails had to be carried overland by oxen.

The nearest railway to Omaha at that time was at St. Joseph, 130 miles down river. When it is realised that for every mile of track laid, the equivalent of 40 freight cars of materials, locomotive fuel and provisions were needed, some idea of the transport problems can be gained.

The Central Pacific faced even greater problems—all their equipment had to be shipped 15,000 miles around Cape Horn by sea!

Hostile tribes

By 1865 work was well under way. The end of the Civil War had released thousands of men from the armies and they readily found work on the Union Pacific scheme. Their military training helped, too, for every inch of the route across the prairies was being savagely challenged by hostile Indian tribes.

In spite of military protection, Union Pacific construction crews had, time and again, to shoot it out with attacking war parties of braves. The famous Major North, a legendary name in American history, raised a company of friendly Pawnee Indians and fought many a running battle up and down the line within sight of the construction crews. Major North's skill at Indian fighting was so great that his band was never once beaten.

Trouble with the Indians went on and on and it was not until the railway had reached



During construction. End of the Union Pacific track near Archer, Wyoming, in 1867.

the foothills of the Rocky Mountains that a peace treaty was signed with the Indian chiefs. So vitally important had peace with the Indians become that the President himself travelled from Washington to meet the chiefs around the camp fire and smoke the pipe of peace.

Now that the full-scale Indian war had ended, construction forged ahead with renewed energy. The Rocky Mountains lay ahead and the Union Pacific crossed them by the famous South Pass—discovered in 1823 by pioneers Ashley and Provost—reaching a summit of 8,013 feet above sea level at Sherman, Wyoming.

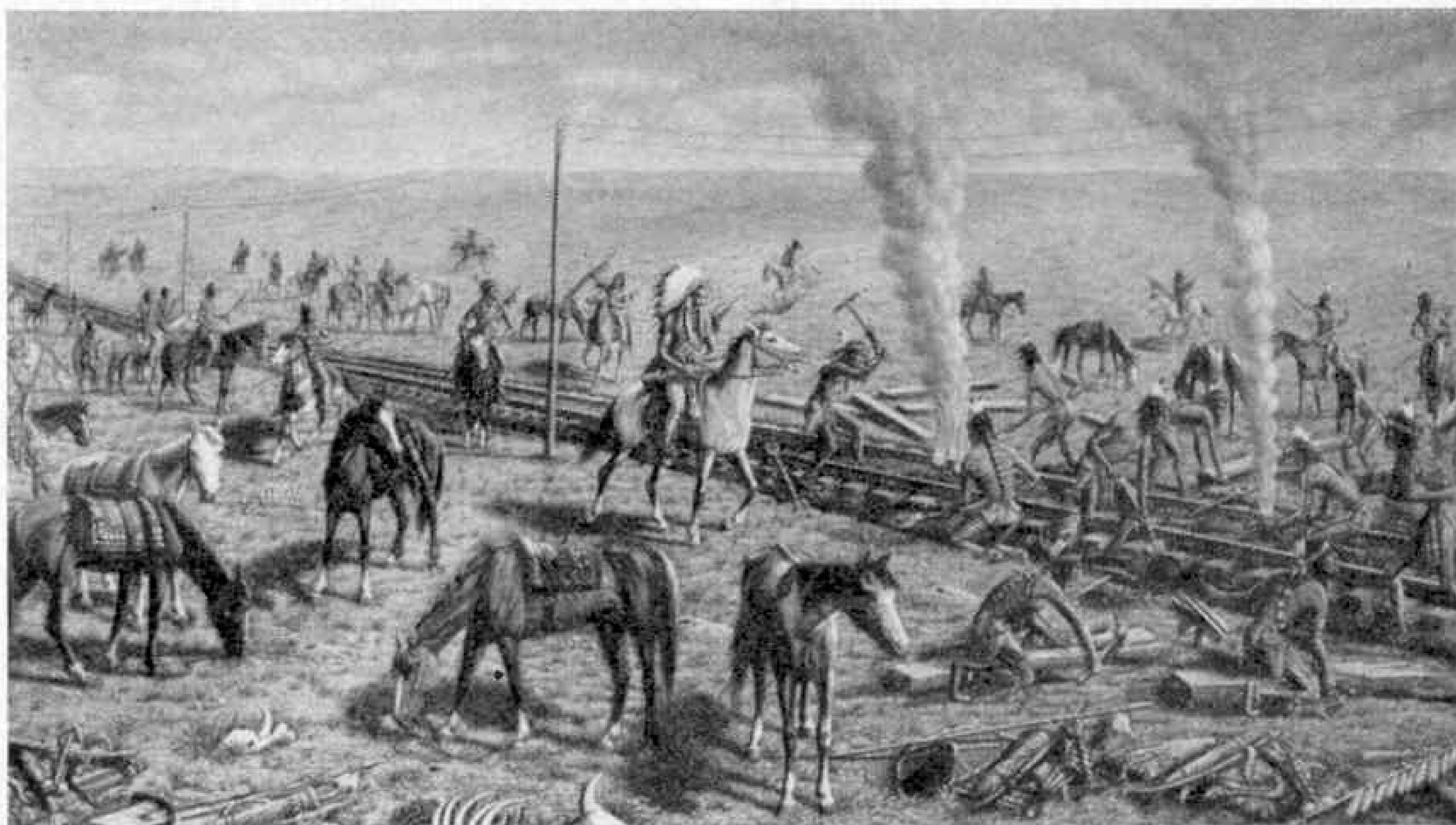
At the railheads, lawless boom towns sprang up. Saloons, with their Faro tables and dance halls, provided entertainment for the workers on the railway. Law enforcement was non-existent, gambling and drinking were commonplace and gun fighting was an everyday occurrence.

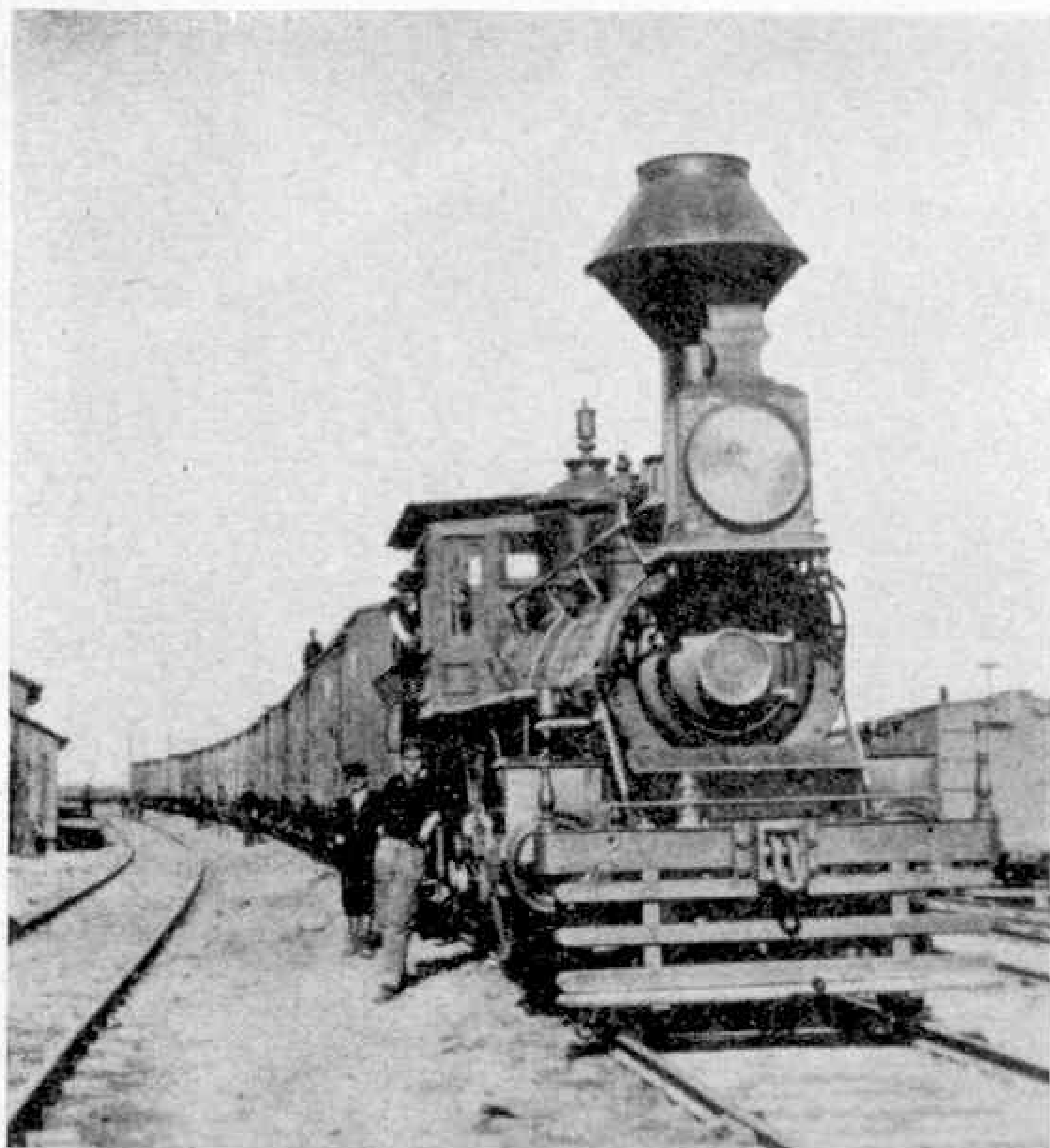
Thrilling names

Cheyenne, Laramie, Green River, Bear River City, thrilling names from the Old West, were all, at one time or another, Union Pacific railheads.

Meanwhile, the Central Pacific's difficulties, although less spectacular, were none

On 28th May, 1869, Tall Bull's band of Cheyenne Indians tore up part of the Union Pacific line. Here is the scene as an artist visualised it.





An immigrant train on the Union Pacific Railroad, about 1870.

the less serious. Within the first 100 miles from Sacramento, the formidable Sierra Nevada mountains barred the way. Labour was extremely scarce for the railway here had to compete for men with the booming Californian gold and silver mines. Eventually, the problem was solved by employing thousands of Chinese labourers.

Armed with nothing more than picks and shovels, hand drills and black powder, they hacked, cut and blasted their way through miles of solid granite. Up and over the Sierras they went, cutting no fewer than 15 tunnels, 12 on the way up, one at the summit, and two on the eastern side.

The Sierra Nevadas are, not without reason, known as the "Snowy Range", and in the winter of 1866-67 forty feet of snow lay on the ground for months. Undaunted, the Chinese labourers covered mile after mile of line with snowsheds. In 1867 the mountains were left behind and the Central Pacific Railroad crossed the State line and on into the deserts of Nevada, towards the ever-advancing Union Pacific railhead.

On 10th May, 1869, the Union Pacific and Central Pacific Railroads joined at Promontory, Utah, just north of Great Salt Lake and 1,086 miles from Omaha. Thus was forged the United States' first trans-continental rail link, one of the most important events in her history as a nation. Omaha

was by now in direct connection with eastern railroads and Pacific and Atlantic coasts were at long last linked all the way. Wagon trains were now a thing of the past and soon many immigrant steam trains were rolling on their way to the Golden West.

The Deadwood Stage

Even after the completion of the railway, the Wild West stayed just as wild as ever. Many years were to pass before it was really tamed. The towns along the route were even more lawless than in construction days. Enormous cattle drives, coming up from the south and south-west, brought the towns a new kind of prosperity, and wild cow hands, eager for fun and excitement after months in the saddle, regularly "tore the towns apart."

Many towns became important junctions for rail and stage coach. The Deadwood Stage really did exist and it left Sidney, a railroad town 414 miles from Omaha, every day for Deadwood in the

Black Hills, a trip of about 260 miles north of the Union Pacific's main line.

Bands of marauding Indians were still giving trouble and often attacked trains and permanent way crews.

For a long time huge herds of buffalo roamed the prairies. Trains were sometimes held up for many hours when a herd was crossing the line. Special steam jets were fitted to locomotives to drive the buffalo off the track, but sometimes the animals were so numerous that it was impossible to force a way through them.

Travelling by train in those days was a very real adventure. Compared with modern American giants, the locomotives of the early days were tiny. Most were wood burners and were of the 4-4-0 wheel arrangement. They weighed only about 20 tons and their tractive effort was in the region of 3,000 lbs. Compare this with the Union Pacific's last steam type, the amazing "Big Boy" 4-8-8-4's which weigh 540 tons apiece and can haul 3,000-ton freight trains unaided over the mountains.

Today, the Central Pacific Railway is part of the Southern Pacific system, and the Union Pacific's trans-continental main line takes a more northerly route to the West through Pocatello and Portland to Seattle.

But even today it is still a great adventure to travel over the old trans-continental railway.

ICES— THEY'RE LOVELY!

● Nearly everybody likes ice-cream. This article tells you how it became popular and how a modern ice-cream factory operates.



These young guests at a children's garden party enjoy their ices as they watch the proceedings.

"MAY I have an ice, please? The man's outside." That is a popular request from boys and girls to their parents in the summer months, and in these days, often in the winter, too. For although at one time ice-cream was regarded as a rare delicacy enjoyed by the upper classes, it is now the world's favourite tit-bit, particularly among young people.

Iced drinks and iced dishes have been known from very early days, and their history is mostly that of aristocratic extravagance. The upper crust of ancient Rome, for example, cooled ice with snow and ate it, while Marco Polo, celebrated Venetian traveller of the thirteenth and fourteenth centuries, is said to have brought back from the East a recipe for milk ices.

In Britain, during the sixteenth century, fruit dishes made with ice appeared on the table at Court, and in the following century Charles the First was so taken with a dish called "Frozen Milk", which was served by his French chef, that he actually gave him a £20 a year pension to make this dish for him alone, and not divulge the recipe to anyone else.

Recipes of 1770

Sweetened and flavoured water, frozen in a box, and packed round with ice, produced those simple ices of King Charles's time, which were similar to the coloured

By
GERALDINE MELLOR

"ice blocks" still familiar today in many countries. Later on, when milk or eggs and cream were added to these frozen concoctions, they received the title of butter ices and cream ices.

Ice-cream, somewhat similar to that we know today was, in fact, first manufactured in England, for cookery books of the 1770 period included recipes for frozen

mixtures containing milk, cream, eggs, sugar, flour, arrowroot and flavouring. Almost identical ingredients were favoured by the big ice-cream manufacturers in this country before the second world war.

The widespread production of ice-cream in Europe generally became practical following the discovery that if salts were mixed with ice, a lower temperature was obtained than that of ice on its own. Then, with the advent of mechanical refrigeration in the nineteenth century, the growth of the ice-cream industry was greatly increased.

Ministry Standards

Today ice-cream is big business. It is estimated that one hundred million gallons are consumed in Britain each year, and that three out of four people eat it.

The two main types of ice-cream made in this country are "dairy" and "ordinary",

and both must conform to standards laid down by the Ministry of Food. These regulations also define the quantities of the different ingredients that enter into the composition of ice-cream. These are, a minimum of $7\frac{1}{2}$ per cent. milk solids, 5 per cent. fat and, in addition, an unspecified quantity of sugar. No artificial sweetening must be used.

Where dairy ice-cream is concerned all the fat must come from milk, and as a rule, it is put to milk concentrate in butter form. Vegetable fat, occasionally whale oil, but usually margarine, is the fat allowed today for ordinary ice-cream.

In fact, present day ice-cream includes plenty of calories; a sixpenny brickette, for instance, contains 114 calories. There are proteins present, too, and ice-cream has come to be regarded as a useful and wholesome food of dietetic and nutritional value.

A visit to an ice-cream factory is an experience that is well worth while. In the first place, every ingredient undergoes a vigorous, critical examination for purity and uniformity, after which the raw ingredients are assembled for processing. This is undertaken in giant, white-enamelled vats with linings and lids of stainless steel. It is tremendously exciting to stand and watch the blocks of dried milk, genuine butter for the dairy ice-creams, sugar, margarine and real vanilla, or strawberry, flakes being put into these huge tubs.

Revolving coils

As a rule the processing is accomplished by steam heat in revolving coils which perform the dual service of mixing the ingredients together and raising the temperature to 145°F. , the pasteurising point, at which it is held for not less than half an hour.

To lower the temperature quickly, the substance, now called the "mix", is pumped at tremendous pressure over a cooler coil, and this process is referred to as homogenisation. It breaks up the stout globules into minute particles and produces a smooth, textured cream which will not run when melted. The mix is

further cooled by passing it into a succession of "ageing" tubs in which it is retained until required for freezing.

The big ice-cream manufacturers invariably select, from the several varieties of freezer employed in ice-cream making, one that is known as a continuous freezer. The mixture from the "ageing" vessels is pumped into this and comes out in an unbroken stream of viscous, frozen ice-cream.

Because, in effect, air has a similar relation to ice-cream as yeast has to bread, a certain and fixed quantity of air is introduced in the process of freezing, otherwise



Above: In Victorian days ices cost only one halfpenny or a penny each. They were sold in glass cups, or in squares of paper. Radio Times Hulton Picture Library photograph. Below: Young holidaymakers at Southend buying their ices.



the end product would be a frozen block of solids instead of a soft, aerated choice morsel.

After going through the freezer the soft ice-cream passes through ejecting devices, and may then be fed into two-gallon metal containers or, if it is to be fashioned into the

that in order to form one of these chocolate-coated bars, ice-cream strips of convenient measurements are cut, and are passed on a conveyor belt beneath a never-ending screen of liquid chocolate. They then travel through a tunnel in which they are frozen, and so move on to the wrapping machines which can encase them in paper or metal foil at the rate of 60 a minute.

A small amount of solid carbon dioxide is put inside the insulated containers, for it has a temperature of 110 degrees below zero, and evaporates slowly so that the temperature of the ice-cream is prevented from rising. *Like other perishable goods, ices are kept in cold storage to meet fluctuations in demand, and the total cold storage capacity of one well-known ice-cream firm is enough to supply a portion of ice-cream to every man, woman, boy and girl in the British Isles.*

The outsize ice-cream vats are kept scrupulously clean and are scoured by a man sufficiently small to be able to crawl inside through an opening three feet in diameter, and able to stand upright inside. He is completely clad in a spotless white coat, and wears white wrappers over his rubber boots.

So next time you buy an ice, remember that you have purchased a toothsome tit-bit that is both hygienic and highly nutritious.



London's first ice-cream barrows were owned by Carlo Gratti, a Venetian refugee. He carried ice from frozen ponds in winter and stored it in 70 ft. deep wells in order to manufacture ice-cream. Radio Times Hulton Picture Library photograph.

famous brickettes, disgorged into strips of the necessary size. Twin-flavoured or multi-flavoured ice-cream may be ejected in the same strip by combining the various flavours and appropriate ejectors.

The ice-cream strips thus formed are, in their malleable condition, passed on by mechanical means to a conveyor which passes through a tunnel, and here frozen air, at a high velocity with temperatures falling to 72 degrees below freezing point, is circulated over the ice-cream. Incidentally, the strips' tunnel journey can take over 60 minutes.

Liquid chocolate

Moving on conveyors to the machines for cutting, the strips are automatically sliced into brickettes, and machines then collect them in units for cartoning purposes. Finally the ice-cream, in its carton, travels on conveyors to special chambers for hardening and storing, and there it stays until it is needed for delivery.

Perhaps *your* favourite is the chocolate ice. If so, you will be interested to know

SEVENTY-FIVE YEARS ON WHEELS

By IAN L. CORMACK, M.A.
(Scottish Tramway Museum Society)

Histories of public passenger transport undertakings always make interesting reading, particularly as, towards the end of the nineteenth century and in the early 1900's, vehicles and methods of operation differed widely throughout the country. There was no standardisation.

Seventy-Five Years on Wheels concerns Barrow-in-Furness, where public passenger transport, in the form of horse-drawn omnibuses, began in 1877. In 1881 the construction of tramways was authorised, and eventually several lines were laid down. The motive power was steam, following the then common practice of using enclosed locomotives hauling two-deck bogie trailers. By the turn of the century, the steam tramways were in a state of dilapidation, and in 1903 the company ceased to operate them. Existing lines were electrified and new ones were constructed, and operation recommenced in 1904. Cars were of various types; both single- and double-deck vehicles were used.

The year 1920 saw the system taken over by the Corporation; then followed the change to bus services, completed by 1932. There is, of course, much more to the story, and the author has dealt in great detail with the system from its earliest days to the present. Details of routes and tickets, and lists of vehicles, are included, and there are many illustrations. The foreword has been written by Mr. Thomas Lord, General Manager of Barrow-in-Furness Corporation Transport Department.

Copies of the book may be obtained from Ian L. Cormack, M.A., of 46 Wellshot Drive, Cambuslang, Glasgow, price 5/6d., post free.

TUNNELLING BENEATH THE THAMES

By

F. H. HOWSON

MANY feet below the River Thames a mighty engineering feat is nearing completion. The long-awaited Dartford-Purfleet road tunnel, fifteen miles down-river from London, has now been driven beneath the waterway and has reached the surface on either side. Kent and Essex are joined physically, and the dream of one Ralph Dodd who as early as 1798 advocated a 2,700-ft. tunnel between Gravesend and Tilbury, has at last become a reality.

At present, there is no river crossing below the Blackwall Tunnel, five miles from London, except the Woolwich and Gravesend ferries. They take only a small proportion of the total cross-river traffic; the rest must make long detours up-river in order to cross. These vehicles, and thousands more, will eventually pour through the new tunnel.

Work on the tunnel began before the war but was suspended for security reasons in 1938, and was not re-started until March 1957. Since then, men have been working night and day in the shafts and tunnelways, at first in wet and exacting conditions caused by water leaking through the river bed. No amount of engineering skill can entirely suppress such leakages but, because of constant care and vigilance, the health of the men employed there has been good.

There is always a certain element of risk in such work, but not nearly so much as constantly confronted the men who, years earlier, built up-river the Thames Tunnel, the first great underwater tunnel in the world. Several lives were lost then, and a reference to this epic work, and the risks taken, will be of interest today if only as a contrast between conditions then and now.

A tunnel under the Thames between Rotherhithe and Limehouse was proposed as early as 1802, and by 1808, under the direction of the famous Cornish engineer, Richard Trevithick, 1,000 feet of pilot



Inside the new tunnel a workman drills and trims the rock face. Illustrations by courtesy of the Dartford Tunnel Committee.

tunnel five feet high had been driven. But the river broke in at this point and the tunnel was abandoned. This failure discouraged financiers and engineers alike, and seventeen years elapsed before work was started on a new venture, the Thames Tunnel, to link Rotherhithe with Wapping. The engineer responsible was Marc (later Sir Marc) Isambard Brunel, but although his famous excavating shield made the tunnel possible, Sir Marc's son Kingdom was the mainspring of the works.

Six inches a day.

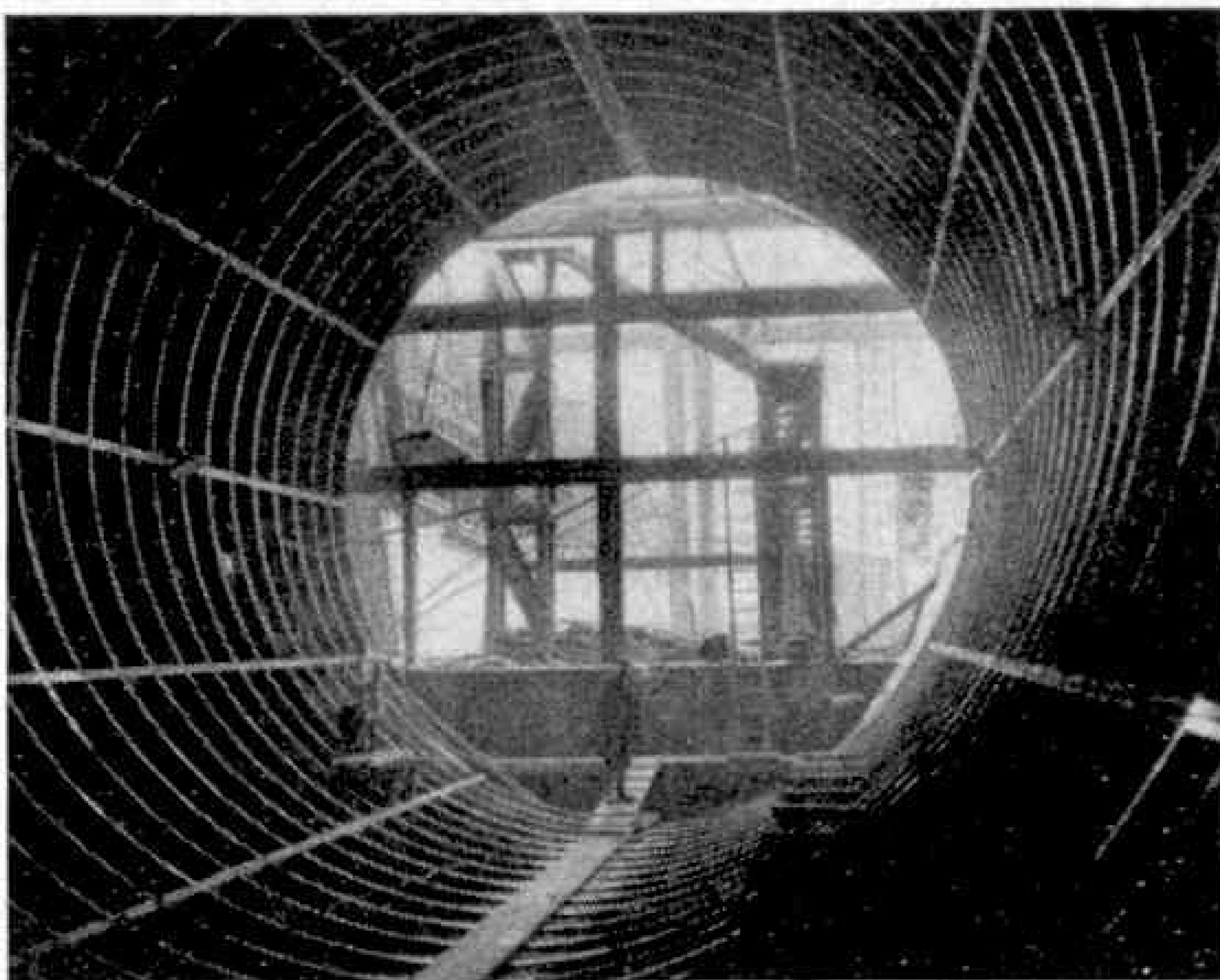
Everything was done on a big scale. To sink the first shaft, a cast iron ring 50 feet in diameter and 42 feet high was placed on the site and the ground beneath it was excavated. Brickwork in the form of a cylinder was built on the ring, and as the total weight increased, and the earth within was removed, so the mass sank at the rate of six inches a day until the lined shaft had reached the required depth. The tunnel itself was excavated with the protection of a massive shield. This consisted of twelve cast iron frames each 3 feet wide and 21 feet 4 inches high. Each frame was divided into three compartments so that the whole, when

assembled at the foot of the shaft, resembled a huge, open-ended, rectangular box, honeycombed with compartments.

In these, the miners hacked at the tunnel face, protected by moveable boards against earth collapses. Working back to back with them were bricklayers who built the tunnel lining, and as the brickwork advanced it was used as a solid base for great screwjacks which forced the shield's cutting edges into the soil.

Creeping forward in thrusts of, at most, nine inches at a time the whole shield, with its men working in flickering gas light, moved under the river. Water and silt running into the tunnel made appalling stench, as the Thames was at this time more or less an open sewer. Fevers resulted from which one man died; another was blinded in one eye.

In 1827, Brunel descended to the river bed in a diving bell and found he could touch the top of the shield with a stick pushed through the mud. A little later, water flooded into the workings and literally washed men to the foot of the shaft, but, although this was a setback, it did not stop work for more than a few months. The river, however, broke in with greater force than ever in January, 1828, and six men were trapped and drowned.



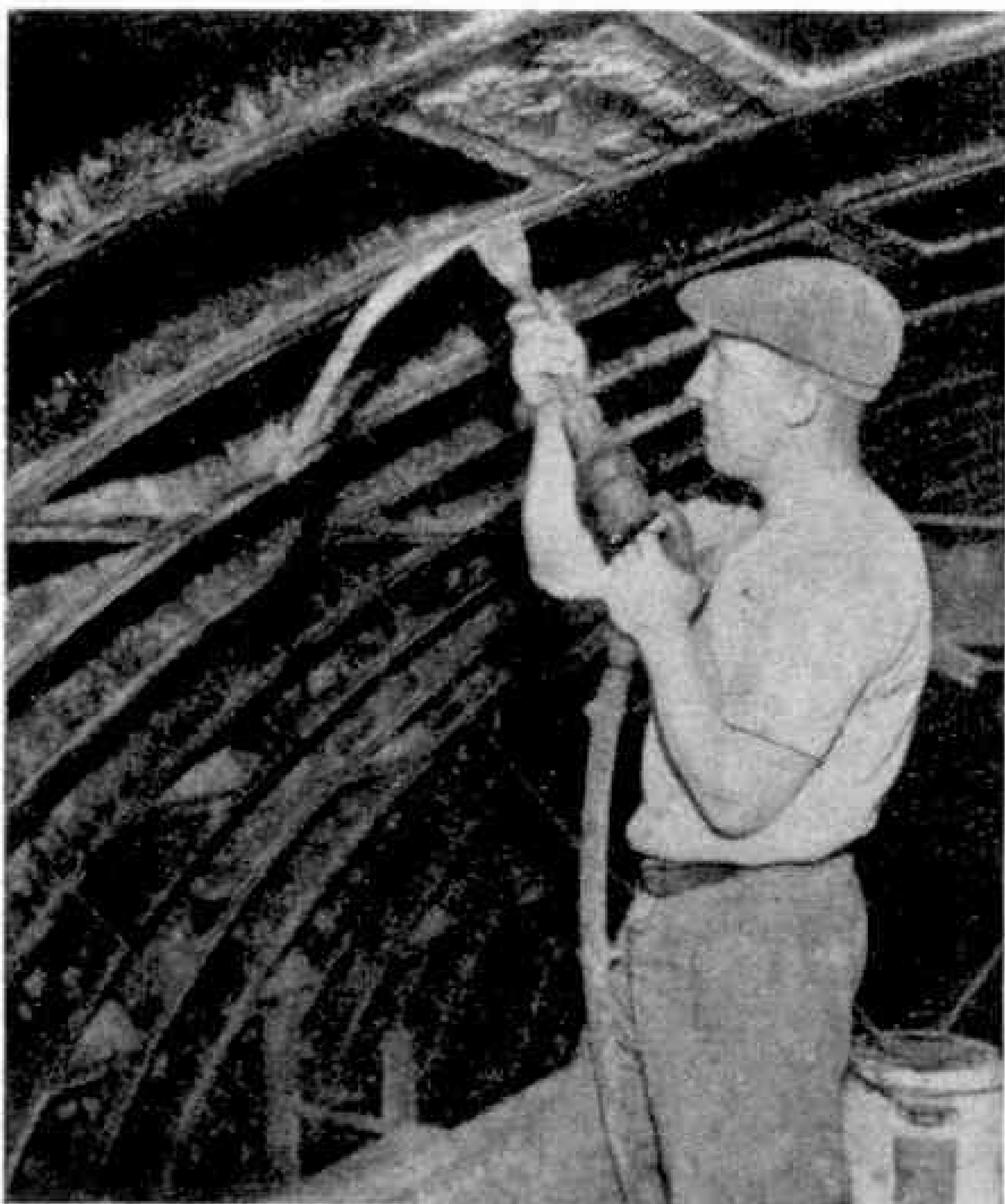
A view southwards through the tunnel to the open cut.

This disaster appeared to settle the fate of the tunnel for good, for the tunnel face was bricked up and all work ceased. But, in 1835, a new shield was built and once again men were at work in the tunnel which finally reached the Wapping shaft in 1841 and was completed and opened in 1843. It was a magnificent, double-arched tunnel intended to take road traffic entering from sloping approach roads, but these were never built. The tunnel was used only for pedestrians until a railway was laid through it in 1869. Electric trains run through the tunnel to this day.

Back, now, to the Dartford project. Owing to the waterlogged state of the ground it was necessary to excavate under-river in compressed air. Men and materials entered and left the workings through two sets of air locks—chambers where the pressure was raised on entry and lowered on leaving—a procedure necessary to protect the men from possible injury to the circulatory system.

This project, one of the very few of its magnitude in Great Britain that has had to be carried out under compressed air, had its own particular problems. If one imagines a cycle inner tube whose rubber is, in part, perished and will not hold air, that part can represent the areas of porous ground over the tunnel. Ordinarily, high air pressure would have been necessary to counteract leakage through the soil into the atmosphere. To remedy this, tubes containing a valve-like contrivance were inserted in the ground, and a processed, liquified clay was pumped through them into the soil which, in time, became impregnated and impervious to air.

(Continued on page 431)



Caulking the interior "ribs" of the tunnel with lead; air pressure 23 lb. per square inch.

America's Flying Coast Guards

By JOHN W. R. TAYLOR



MOST of us think of coast guards as men with long telescopes, stationed in look-out towers along the seashore to keep an eye open for smugglers. This is the job for which the first coast guard units were formed in Britain, France and the United States two centuries ago; but today they perform many additional duties, the most important being to help sailors in distress.

That is why Lieutenant-Commander Jim Durfee found himself flying a Sikorsky HUS-1G helicopter towards the oil tanker *Indiana* in the Gulf of Mexico a few months ago. Ninety minutes earlier, a seaman on board the vessel had been badly burned in an accident. He needed urgent hospital treatment and Commander Durfee, skipper of the U.S. Coast Guard's all-helicopter search and rescue detachment at New Orleans, had flown out to fetch him.

Hail over the Radio

As the ship hove into view, Durfee hailed it over his radio:

"U.S. Coast Guard helicopter 1332 calling tanker *Indiana*. We have you in sight and are approaching. Is your man a litter

patient or can he walk?"

"Our man can walk and is ready for the pick-up", the tanker's captain radioed back.

"There's not room to land on your deck," said Durfee. "We'll have to hover 50 feet above you. If you will take up a heading of 220 degrees true and reduce speed to maintain steerage way, the wind will be on your port bow. That will allow us to head into the wind and still see what we are doing as we make the pick-up."

Durfee switched on the helicopter's intercom and spoke to Jack Leitner, Aviation Machinist Mate First-Class and hoist operator, who was waiting in the main cabin.

"I have the tanker in sight on our port bow, Leitner. Check the hoist and connect the rescue basket."

"Ready for the pick-up"

Leitner, veteran of many similar rescue missions, hooked to his waist a safety line hanging from the roof. He then slid open the big cabin door, pressed the starter button of the electric hoist and watched as the hook at the end of the steel cable wound up and down. Quickly, but carefully, he

attached a rescue basket to the hoist and guided it out through the door, at the same time speaking into the mouthpiece of his headset:

"Hoist is operating properly sir. Basket is hooked. Ready for the pick-up."

Durfee glanced across at his co-pilot, Chief Petty Officer "Crash" Causley, one of the Coast Guard's first helicopter pilots. Causley nodded that all was O.K., and the HUS-1G



Lieutenant Benjamin F. Weems, of Miami, in the pilot's seat of the Sikorsky HUS-1G helicopter, gets the "crank up" signal for a night flight from Aviation Machinist Mate First Class J. M. Leitner, of Kansas City.

dropped down towards the tanker, which was tossing in a choppy sea. Leitner leaned out of the cabin door, talking the pilots down with a steady stream of directions:

"Steady as she goes, sir. About 50 ft. more Ten feet to the right Doing fine, sir About five more feet to the right To the right a little more Four or five feet forward now The basket is going down It's on the deck The man is in the basket. . . . Taking

bitten by a rattlesnake, a duck hunter lost in the vast swamps, an outboard motor boat that has run out of fuel on a fishing trip, a man who has fallen overboard at sea, an oil barge that is overdue, or it could be a search for bandits who have fled down-river. It might mean rushing a doctor through foul weather at night to save the life of a baby at an isolated home in the marshy bayous.

Calls for help come from scattered points

across thousands of square miles in the Mississippi delta region and the shark-infested waters of the Gulf of Mexico. Sometimes they involve hours of patient searching over the great swamp-lands of the Mississippi, which are laced with a labyrinth of small waterways, slews, bayous and ribbons of canals dredged by oil companies. Fog often closes in quickly, making the work difficult and

dangerous. But this is all part of the Coast Guard's job and the helicopters are usually airborne within five minutes of receiving an alarm call during the day and within 20 minutes by night.

In a single year the New Orleans Air Detachment flew 510 search and rescue missions in Sikorsky HO4S-2G helicopters,



The Loening amphibian with Liberty engine—the first 'plane purchased by the U.S. Coast Guard.

slack out of the line The basket is clear of the boat, sir The basket is level with the doorway The basket is in the cabin We're ready to go home, sir!"

Durfee added a burst of power and pulled up the collective-pitch stick. Like a pigeon released from its cage the helicopter fluttered sharply upward. In its cabin, Leitner made the patient comfortable.

Always Ready

Within an hour, helicopter 1332 landed on a sports field next to the Public Health Service Hospital in New Orleans. The injured seaman was hurried off to the emergency ward and the Coast Guard fliers returned to their hangar at Alvin Callender Field, the naval air station just south of the city, to await the next emergency. The call might be to a child



The Coast Guard's new prop-jet Hercules locates a "vessel in distress" during a demonstration off the Virginia Capes. The aircraft is the Lockheed SC-130B Hercules; playing the role of the ship in distress is the Coast Guard cutter "Ingham"

before it got its new and larger HUS-1Gs, logging 1,023 hours and covering 53,943 miles. In doing so it added many names to the list of over 8,000 men, women and children whose lives have been saved at sea by America's flying Coast Guards. Yet it consists of only six officers and 15 men, and the entire flying branch of U.S. Coast Guard Service has only 351 officers, including 312 aviators, and 1,091 other ranks, of whom eight are pilots.

Its equipment consists of about 130 aircraft of eleven different types, based on air stations at Salem, Massachusetts; Brooklyn, New York; Miami and St. Petersburg, Florida; Traverse City, Michigan; San Diego and San Francisco, California; Port Angeles, Washington; and from air detachments at Washington, D.C.; Quonset Point, Rhode Island; Keesler Air Force Base, Mississippi; Corpus Christi, Texas; New Orleans, Louisiana; Argentia, Newfoundland; Bermuda; San Juan, Puerto Rico; Kodiak and Annette, Alaska; and Barbers Point, Hawaii.

Some indication of the value of the service is given by the fact that the U.S. Government has spent millions of dollars on six specially-equipped SC-130B models of the 67½-ton Lockheed Hercules turboprop transport, to replace the ex-Air Force Fortresses used for long-range sea rescue missions since the war; yet nobody would produce a single cent when the idea of a Coast Guard aviation service was first put forward in 1915.

The men responsible for the suggestion were Captain B. M. Chiswell, Second-Lieutenant Norman Hall and Third-Lieutenant Elmer Stone of the cutter *Onondaga*. One of the most difficult tasks of the Coast Guard at that time was searching the sea lanes for derelict schooners, and it seemed to these three officers that the job would be done much more easily and quickly from the air.

In the Spring of 1916, when the *Onondaga* was at Washington, they managed to invite on board Glenn Curtiss, the famous aircraft pioneer, and Byron R. Newton, the Assistant Secretary of the Treasury who, as a young reporter, had watched the Wright Brothers flying at a time when few people were willing to believe they had done so.

After the meeting, Curtiss designed a "lifeboat plane." This was a triplane flying-boat with a short hull and with the tail surfaces carried high to the rear, on booms.



Changing of the Guard. Two of the U.S. Coast Guard's version of the Sikorsky HUS-1G (left), latest addition to its helicopter search and rescue fleet, arrive at the Coast Guard Air Detachment in New Orleans, to replace the smaller Sikorsky S-55s (right).

Twin propellers, mounted in front of the wings, were turned by a single engine installed in the hull. After flying quickly to a ship in distress or to a craft suspected of smuggling, this machine would have alighted on the water, shed its wings, tail-booms and propellers, and proceeded on the surface under its own power.

All seemed to be going well when the U.S. Congress passed a law providing for the establishment of ten Coast Guard air stations, with a flying school and a complement of fifteen officers and 40 men. Unfortunately, it refused to set aside any money to make the scheme practicable.

Trained by U.S. Navy

This disappointment did not prevent the service from getting eighteen officers trained as pilots by the U.S. Navy, and when America entered the first world war, in 1917, these men gave a good account of themselves with the Navy's Aviation Division. Afterwards, one of them, the former Third-Lieutenant Elmer Stone of the *Onondaga*, flew as co-pilot of the Curtiss NC-4 flying-boat which became the first aeroplane to fly the Atlantic, via the Azores, in May 1919.

Still the American Government refused to finance a Coast Guard aviation service. The Navy helped once more, by lending six small Curtiss HS-2L (Continued on page 431)

New Launch Has Many Fittings

THE new Hornby Speed Boat No. 5—the R.A.F. Range Safety Launch—is remarkable for its long-running clockwork motor, accurate detail and attractive appearance.

It is the first model boat Meccano Limited have produced since 1939. The motor has been nickel-plated to prevent rust and the craft will travel 120–140 feet at one winding. The hull is of moulded cellulose acetate and much interest lies in the fact that several deck fittings, including the anchor and the hand-rails, are supplied in do-it-yourself kit form.

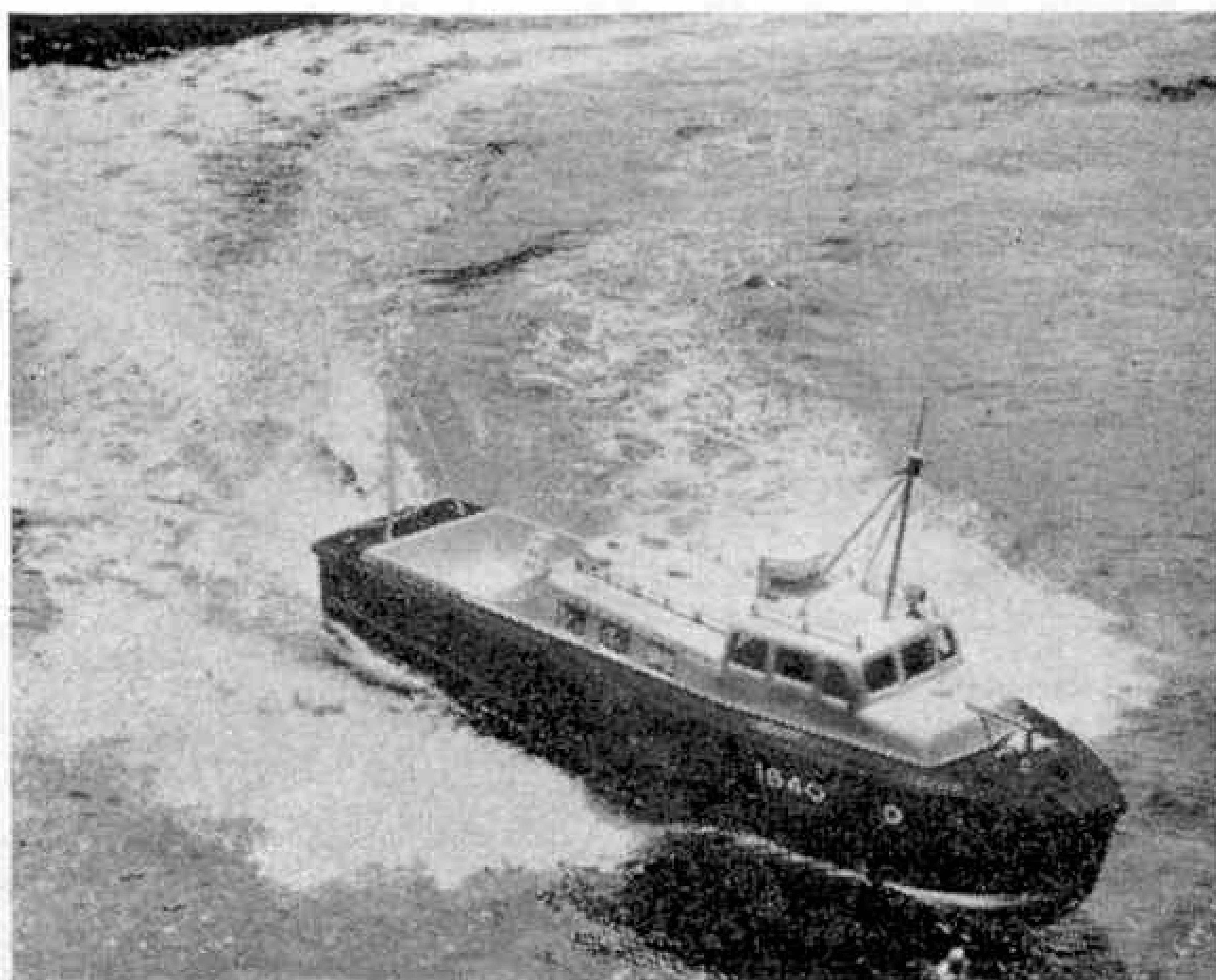
The model has a length of 10 inches, with beam of 3 inches, and has a black hull carrying the R.A.F. roundel and the number 1640—the same number as that carried by the first of these craft to be taken into service by the R.A.F. The decking is brown and the superstructure white.

On the superstructure are a tripod mast, searchlight, port and starboard lights, hand-rails, two Kisbey life buoys, two boat hooks, a large ventilator over the cockpit and two smaller ventilators aft of the deck housing. In the well are two ladders and the engine housing. At the stern is another tripod mast, or Ensign Staff. The launch's brass rudder is adjustable.

The real craft had to meet stiff operational requirements from the Air Ministry and was designed and built by Thornycrofts, who installed twin Rolls-Royce 06 type marine diesel engines which give it a speed of 20 knots with a range of about 200 miles. The actual launch is 43 feet in length with a beam of 12 feet 6 inches, and a draft of 4 feet 4 inches aft. The hull is

made of double skin teak planking on steam-bent timbers. This construction gives flexibility to the hull and greatly reduces the chance of damage in rough weather.

Air heating and insulation have been installed so that the craft can be used in arctic and tropical conditions. Four stretcher cases can be taken under cover and there is room for 30 passengers.



Which is which? The new Hornby Speed Boat No. 5, R.A.F. Range Safety Launch has a purposeful look when set against the same sea background as the real craft. The actual launch is shown in the top picture.



A formidable combination in World Championship racing—Joakim Bonnier and the B.R.M. See "Racing Personalities" at the foot of the next page.

Road and Track

IN the world of motor-sport there has been much drama and tragedy this season and very little attention has been paid—either by the enthusiast or the public—to the Bluebird project. However, next month Donald Campbell will be going to the Bonneville Salt Flats, at Utah, U.S.A., where he will attempt to beat the late John Cobb's land

By
Peter Lewis

speed record of 394 m.p.h. This is a tremendous undertaking which will be rewarded with world-wide prestige if it succeeds.

Bluebird's engine, the Bristol Siddeley Proteus, is basically similar to that which powers the Britannia airliner and, like all gas turbine aero engines, it develops high power for small bulk and weight. One version of the Proteus gives well over 4,000 h.p. for a unit

little more than nine feet long, about three and a half feet in diameter and weighing one and a half tons.

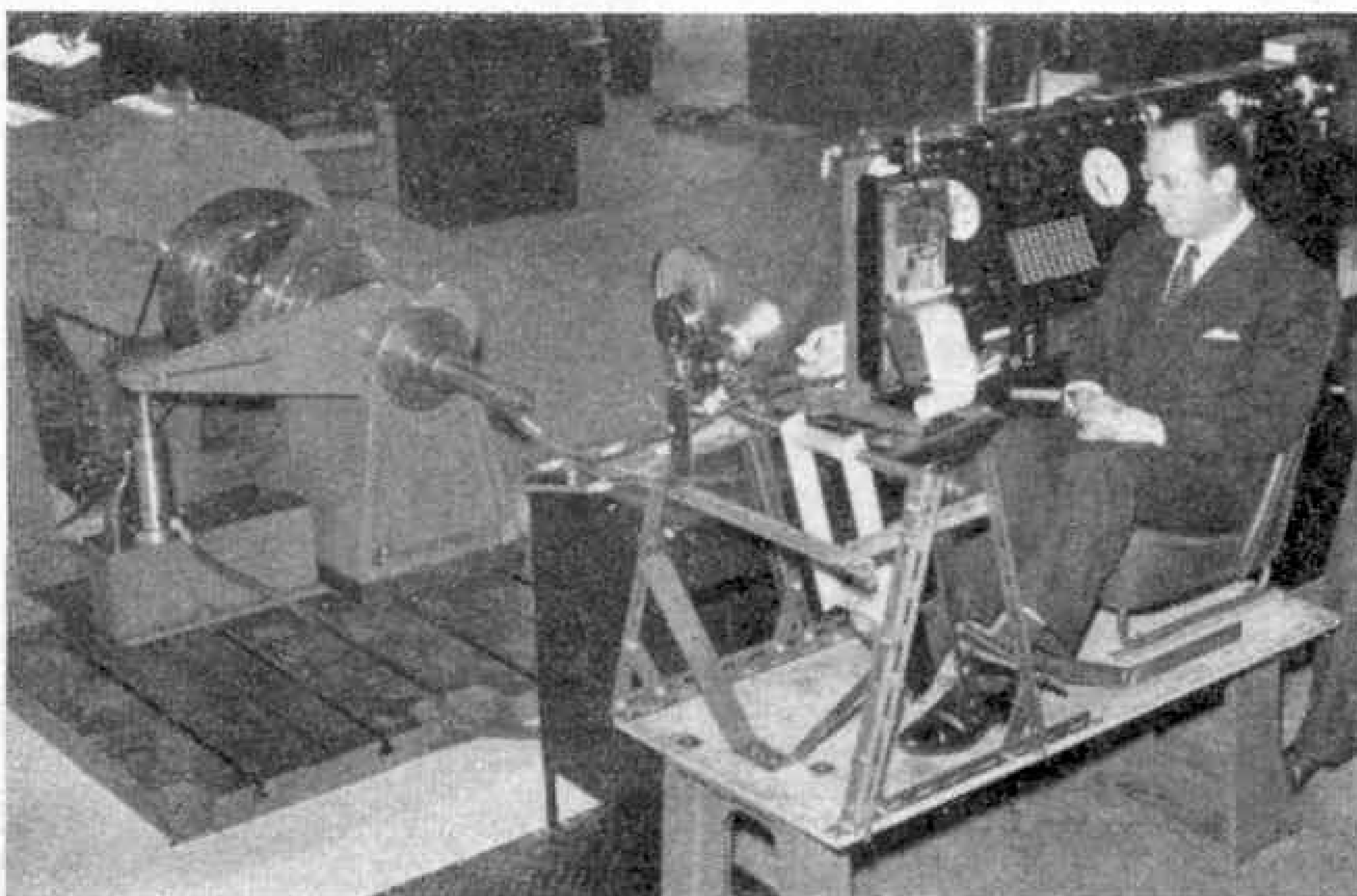
The transmission system is simplicity itself: a drive, running at turbine speed, is taken from the front of the engine to the front wheel differential; a similar drive, from the rear of the engine, moves the rear wheels. Because of the performance flexibility of the gas turbine and its ability to deliver high torque at low speeds, no clutch or change speed gears are required. The regulations governing the record attempt no longer call for reversing gear.

The problem of stopping Bluebird is a very real one. Girling disc brakes and Ferodo pads have been chosen for the task of bringing the car to a halt from speeds that may well be in the region of 475 m.p.h.

Bluebird will have seven miles in which to pull up. Initially, air flaps will reduce speed to about 400 m.p.h. and then, in the next 60

Brakes for "Bluebird." In a skeleton cockpit in the Ferodo test house, Mr. Donald Campbell watches the pedal pressure gauge while he gets the feel of the pedal, shortly before testing one of the specially-designed Girling "Bluebird" disc brakes on the dynamometer machine to the left of the picture.

Photograph: Ferodo Ltd.





A Vauxhall Victor seen against a background of the King's School, Ely, one of the oldest schools in the country.

seconds, the Girling discs have the task of bringing the car to a halt. Since Bluebird weighs 8,000 lb. this means dissipating 42 million ft. lb. of energy in a minute, the

equivalent of stopping 63 ten-ton trucks from 30 m.p.h.

Most of this energy will be dissipated by the Ferodo pads which are manufactured from a friction material moulded from asbestos fibres, synthetic resins and metallic powders blended with various friction additives. This friction material has proved successful on the Meteor Jet Fighter.

The four disc brakes, which act "inboard" on the car, each have two calipers, and each caliper carries six friction pads. Three of these are stationary, the opposing three being hydraulically operated and when the brake is applied the disc is gripped between the fixed and the free pads.

THE VAUXHALL VICTOR

In 1957 Vauxhall Motors introduced the Victor, a car criticised at the time for its exterior lines. Today, following a revision of the styling, the low-built Victor is not only one of the nicest looking cars on the road but also

(Continued on page 431)

Racing Personalities: Joakim Bonnier

When the bearded Swede, Joakim Bonnier, won the Dutch Grand Prix at Zandvoort in May 1959 it was the first World Championship victory for B.R.M. It also established Bonnier firmly as a top-flight driver, for he had already driven some fine races for B.R.M. during the previous season. As the 1959 season drew to a close, by which time Bonnier had strengthened his position in the public eye with a creditable record of racing both B.R.M. and Porsche cars, it became apparent that he would eventually become a serious contender for the World Championship of Drivers.

The reason is not far to seek. He is first and foremost a careful driver, refusing to be drawn into any unnecessary duels or carried away by his own exuberance. He is quite content to bide his time in a race and equally content to wait until the time is ripe before making an all-out bid for the title of Champion of the World.

He is a first-rate team driver, amenable to discipline, conscientious to a degree, and is developing into an all-rounder of the calibre of drivers like Moss, Hawthorn, Collins and Behra. Finally, he has courage and determination, and the will to win in the face of misfortune, which has always been the hallmark of the greatest racing drivers.

During the 1960 season he has put up some very fine performances with a works Porsche in sports car championship races, including a win in the gruelling Targa Florio, with Hermann. His racing with B.R.M. has not been such a happy story. In the Argentine Grand Prix he looked all set to win until a sick engine and a pit stop put him right out of the picture: at Monaco a broken hub carrier robbed him of second place after a fine drive; at Zandvoort the engine blew up, spewing oil on to the rear tyres and sending the B.R.M. off the road and into the sand dunes; at Spa, after a closely-fought duel with McLaren, Graham Hill and Gendebien, engine trouble forced the B.R.M. out yet again.

This month you should be able to see Joakim Bonnier at Goodwood in the Tourist Trophy Race on 20th August and at Brands Hatch a week later. Watch him carefully, for with the right car Bonnier is one of the finest drivers on the circuits today.

J. W. GAHAN**DESCRIBES**

An East Anglian Rail Tour



The M. & G.N. special train at Whitwell and Reepham Station.

THE time was 12.15 p.m.; the date, 21st May, 1960. Norwich City Station, once a passenger terminus, presented a busy scene, such, in fact, as it had not experienced for a long time. A passenger train occupied one of the platforms. It was a "Special", organised by the Preservation Society for the Midland and Great Northern Joint Railway, to tour some of the M. & G.N. lines and other ex-Great Eastern tracks in Norfolk and Suffolk, taking in some of the picturesque Broads area as well as the rural country and seaside resorts of Norfolk.

The Midland and Great Northern Railway Preservation Society exists for the purpose of re-opening sections of this railway which was largely closed to passenger traffic in February 1959, certain sections also being closed completely in favour of alternative routes. It is not a museum project, but the intention is to provide train services for the people affected by the closures. It has a large membership and many sympathisers throughout the country.

Brass highly polished

A large number of passengers came from London and arrived a few minutes before the departure time of 12.20 p.m., but not too late to have a look at the engine, which was ex-Great Eastern J15 0-6-0 65469, built in the 'eighties, rebuilt in 1908, and which looked its age. Although probably long removed from the paint shop, it had been agreeably cleaned, with the brass ring between the smokebox and boiler highly polished, and it stood there awaiting departure with the Westinghouse brake pump

gently working, sending short spurts of steam upwards. Cameras were levelled at it from all angles. The locomotive had been specially chosen to lend old-time atmosphere, but it was a type which never worked to any great extent on the M. & G.N., although familiar on the G.E. lines of East Anglia. There were no original M. & G.N. engines left to choose from!

Numerous people were at the station to see the train leave, for it was probably the first passenger train seen there since passenger services were discontinued. The station seemed to handle plenty of goods traffic.

Over 300 passengers

The special train itself was formed of six coaches, four being ex-L.N.E.R. corridors in red and cream, a B.R. Standard coach in maroon, and an ex-L.N.E.R. buffet car also in red and cream. The buffet car staff worked extremely hard and no one went hungry. There were more than 300 passengers, most of them from the London area, others from places far afield. All were set to enjoy the day, although the weather was dull and cloudy.

Departure time arrived and the loaded train drew on to the single track leading to Melton Constable. The fact that no passenger train had traversed this line for a long time was amply demonstrated by the reactions of the animals in the adjacent fields. Horses, cows and sheep fled as the engine whistled and steam and smoke

drifted towards them. Probably goods trains did not cause them much disturbance, but a passenger train with a steam locomotive travelling at speed and whistling shrilly must have been quite alarming, even though the animals were apparently undisturbed by jet 'planes which thundered overhead.

Passing through the stations of Hellesden, Attlebridge and Lenwade, it was noted from the wagons of coal there that the sidings were still in use at these places. At Lenwade is a concrete works from which British Railways obtain much of their material for use in connection with the electrification scheme between Liverpool, Manchester and Crewe. After a run of thirteen miles, the train halted at the small country station of Whitwell and Reepham, where a stop of about five minutes was made for photographs to be taken.

Once the hub

Off again, passing through the stations of Guestwick and Hindolvestone, now closed, to Melton Constable. This was once the hub of the Midland and Great Northern Joint Railway, where the locomotive and carriage works were situated, and the town was known as the Crewe of East Anglia. It was mainly a railway town, but now, so far as railways are concerned, it is largely a ghost town, as it is served, so far as passengers are concerned, only by the branch from Cromer. A stop was also made here for about ten minutes, and more photographs were taken.

Members of the party, searching for relics of the old days, found only some narrow gauge track, the bodies of two old coaches and an ancient six-wheeled coach. The works here were actually closed by the L.N.E.R.

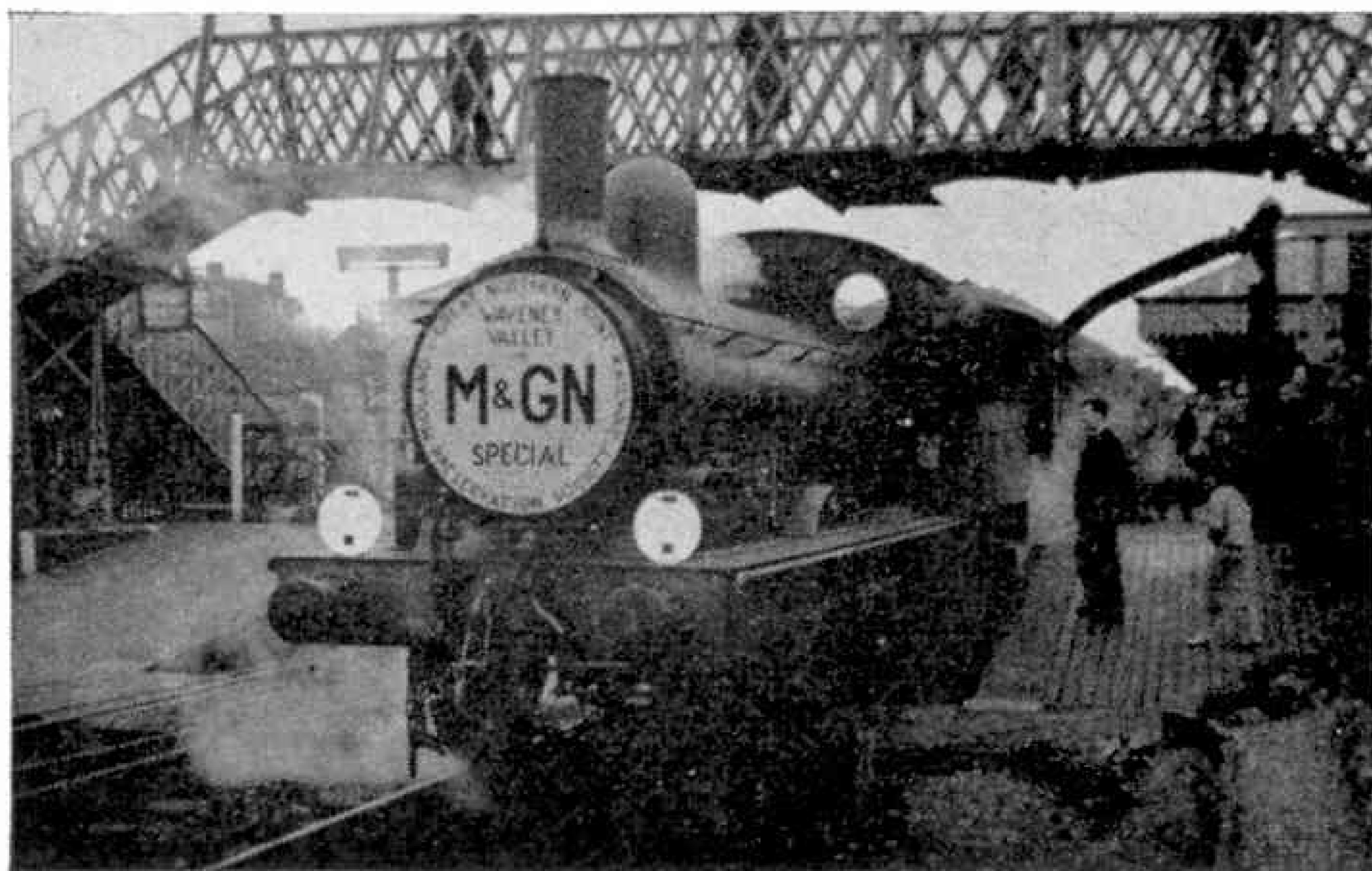
shortly before the last war, and now present a scene of desolation. At the engine shed the tracks were deserted and the engines had vanished, as also had the turntable. Strangely enough, three diesel locomotives were discovered near the station, two being of the Brush A1A-A1A type, and the other a shunter. A diesel multiple-unit train was also there.

On its way once more the train moved on to the still-used section of the line towards Cromer, and made a good run over the steep banks, the engine puffing lustily, passing through the market town of Holt and so on through Weybourne where the North Sea came into view and remained in sight as far as Sheringham, a popular East Coast holiday town. Here, the train stopped for water. This operation was much photographed and passengers from other trains watched with interest.

The next call was to be North Walsham, but in the vicinity of Cromer the Midland and Great Northern line was left and now the train was traversing the ex-Great Eastern route from the Cromer Junctions to Norwich (Thorpe).

At North Walsham the M. & G.N. "main line", which once carried heavy summer holiday traffic from the Midlands to Great Yarmouth, but is now abandoned, was sighted. Some of the track had already been removed. A scheduled stop of 20 minutes was due here, but owing to late running this was cut to five minutes. People from the surrounding district turned out to see the train, but many passengers were disappointed that they were not able to inspect the connection, put in fairly recently, between the M. & G.N. and the G.E. line.

At Sheringham, the special train is seen taking water.



Heading back now, but over the Great Eastern route via Wroxham, the train once more approached Norwich. The Wensum Junction and Norwich avoiding curve were traversed and at Swing Bridge Junction we entered on to the main line to London. This was to be followed as far as Tivetshall.

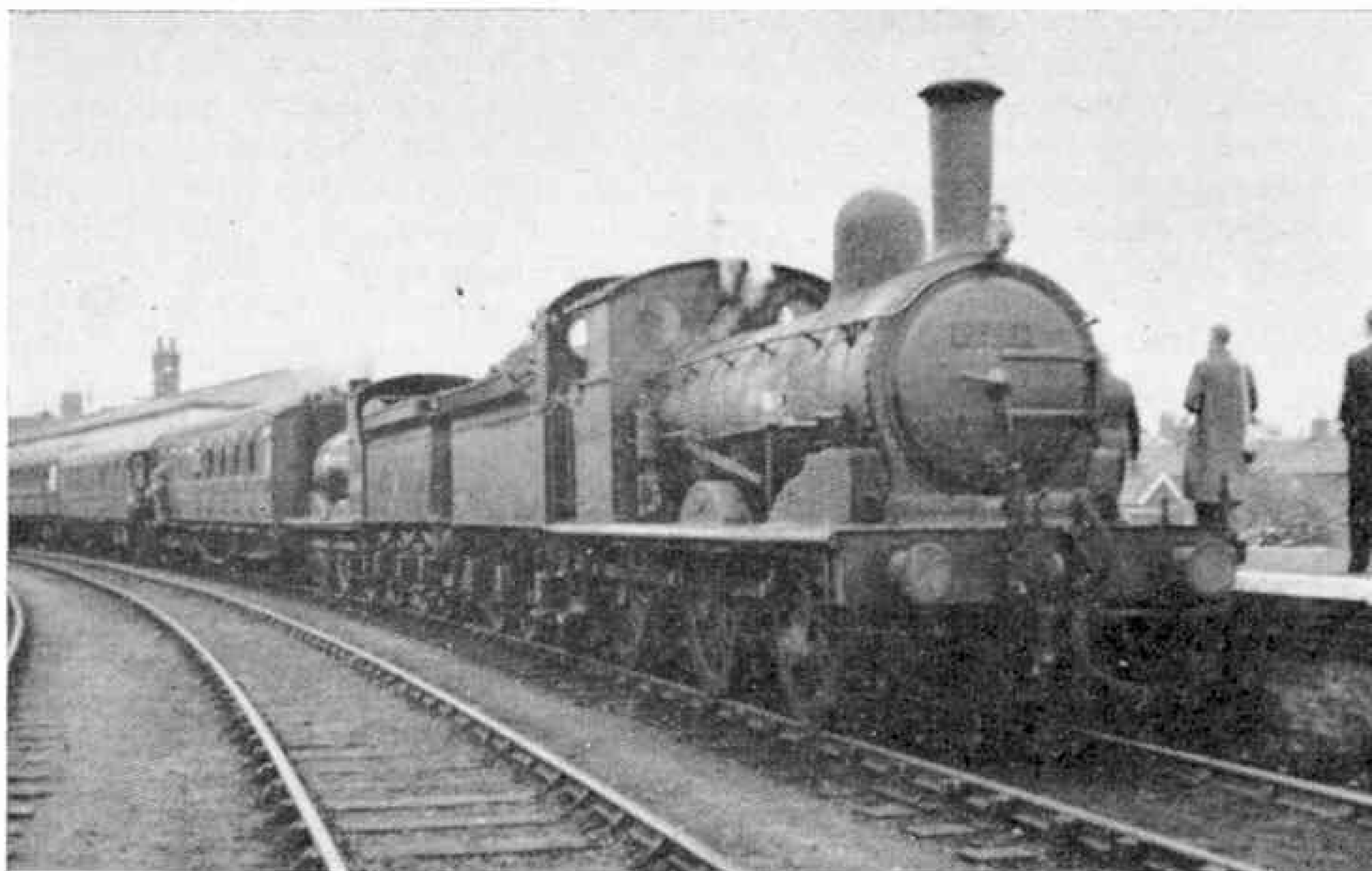
Came to a halt

We had not gone very far when signs of trouble were apparent and the train finally came to an ignominious halt somewhere between Swainsthorpe and Forncett. Black

Market, which has a group of sidings, but the only rolling stock present was a solitary Southern Region van. One mile further on the train passed through Pulham St. Mary Station and then Harleston, where there were several wagons on the sidings.

Several other stations were passed, and at nearly all of them there were people to watch the train passing, for it is improbable that a passenger train will ever traverse this branch again.

At some places along the line were dis-used sidings, built to serve war-time air-



Class J15
0-6-0s Nos.
65462 (front)
and 65469 on
the M. & G.N.
special train.
The illustrations
are from
photographs
by R. Stevens.

smoke poured from the engine, which was not steaming well. It was impossible for the train to proceed until the fire had been overhauled, but this was done after a few minutes' delay and the journey was resumed.

On reaching Forncett the train was shunted into a siding. While it stood there, a couple of expresses came by at high speed hauled by diesel and Britannia-class engines respectively, but after a southbound diesel multiple-unit train had departed our train was allowed away once more. The crew had obviously been successful in cleaning the fire, because the engine began to blow off, and there was no further trouble.

At Tivetshall, the tender tank was filled again, and then we moved eastwards on to the Waveney Valley line, closed to passenger trains in 1953 but still open for freight traffic at some stations. This line was reduced to the status of a Light Railway in 1955, which means that a maximum speed of 15 miles an hour must be observed. There are numerous level crossings and the whistle was sounded frequently.

First station on this line was Pulham

fields now long abandoned. For most of the distance the line follows the River Waveney, which marks the boundary between Norfolk and Suffolk. Just before reaching Beccles the train crossed the river and passed into Suffolk. At Beccles, the engine had to run round the train for the journey to Lowestoft. Here, two J15 0-6-0s were the only locomotives to be seen, and one of them 65462, was commandeered to assist our own engine.

After running round and coupling up had been completed, the train set off for Lowestoft with the two engines coupled tender to tender. Oulton Broad South was soon reached and approaching Lowestoft the train passed over the junctions with the Norwich and Yarmouth (South Town) lines. Reversing was necessary again at Lowestoft, a terminal station, and the train was drawn back by an L1 tank to release our own engines.

Lowestoft was mainly occupied by fish vans, and the locomotives at the depot were nearly all diesel types. An interesting relic here was an old

(Continued on page 431)



Boeing 720 airliner of United Air Lines, U.S.A.

Baby Boeing

By
John W. R. Taylor

IF you were asked to name the type of aircraft illustrated above, most of you would probably say "Boeing 707". In fact, it is one of the 707's baby brothers, a Boeing 720 of United Air Lines.

Before you get any wrong ideas, I had better point out that even the baby of this family is no tiddler. The 720 is small only when compared with the Boeing 707 or

AIR NEWS

Douglas DC-8. It is still far bigger than most other airliners, with a span of 130 ft. 10 in., length of 130 ft. 6 in., loaded weight of more than 98 tons and seats for anything up to 149 passengers.

Because the 720 is designed to fly shorter distances than the 707, with a maximum stage length of 2,500 miles, it needs to carry much less fuel and this has enabled Boeing to lighten its structure. At the same time, the wing leading-edge has been extended forward near the fuselage, giving an increased sweepback and thinner wing section, with the result that the 720 will cruise at a really sizzling 615 m.p.h.

Most of the 49 Boeings 720's ordered so far will be operated on domestic routes

inside the United States by American Airlines, United Air Lines and Western Air Lines. But we might catch an occasional glimpse of them, as Irish International Airlines have ordered three for use on their transatlantic service.

Six-country Patrol Bomber

One of the aims of NATO is to ensure the closest possible collaboration between member nations in defence production, as a means of cutting costs. The most remarkable example of how this can be achieved is given by the new Breguet 1150 Atlantic maritime patrol bomber, which will eventually replace the Lockheed Neptunes now used for overwater reconnaissance and anti-submarine duties.

The Atlantic will not only go into service with many different air forces, but will actually be built up of components manufactured in six different countries. The present plan is for the outer wings to be built by Sud-Aviation, in France, the inner wings and engine nacelles by Fokker, in Holland, the rear fuselage and tail by Dornier, in Germany, and the main fuselage by Breguet, in France. Breguet will also be responsible for final assembly, using further components produced in Belgium and fitting two Rolls-Royce Tyne turboprops from England and electronic equipment from the United States.

If the whole lot goes together, the Atlantic will span 124 ft., weigh 86,000 lb., carry a crew of 12 and have a top speed of over 375 m.p.h.

Everything went by air

The famous American musical *My Fair*

Lady broke another record this Spring when its actors and actresses, technicians and all the stage properties were flown from New York to Amsterdam and on to Moscow, where the show began its Russian tour. Eight four-engined aircraft belonging to K.L.M. were needed to carry what proved to be the largest commercial air shipment ever flown across the Atlantic. The stage properties consisted of no fewer than 2,500 items, with a total weight of 65 tons, including two complete revolving stages weighing over 12 tons each.

Hotting up the Sabre

North American's F-86 Sabre fighter was the first combat aeroplane able to reach supersonic speed in a dive and was good enough to score a 14-to-one victory over the MiG-15 during the Korean War: but that was seven or eight years ago. In the meantime, much faster fighters have come along and the Sabre has begun to take a back seat in the U.S.A.F.

It appears, however, that the saying about old soldiers never dying applies to aeroplanes as well as human fighters, because North American have recently fitted an F-86F with a rocket-motor which may give it an entirely new lease of life. The motor, a 6,000 lb. thrust Rocketdyne AR2-3, is slung beneath the fuselage in a pod about half the size of the cockpit canopy. When in use, it enables the Sabre to fly faster than sound in level flight, to reach a height of over 60,000 feet and to climb 15 times faster than it normally does at heights over 40,000 feet.

Fitted also with Tacan navigation radar and Sidewinder air-to-air missiles, the new "super performance" Sabre offers a highly-

effective atomic-age interceptor to air forces that cannot afford anything so advanced as a Convair F-106 or English Electric Lightning.

No Passports to Paris

Paris is the latest place to which British and Irish citizens can fly without needing a passport. What is more, a 48-hour trip to the French capital costs as little as £6 1s. in fares from Lympne Airport in Kent by Skyways Coach Air service. Instead of a passport, passengers carry only an identity card which can be obtained from the airline or a travel agency.

Otter on Stilts

Over the past few years we have seen Canadian-built de Havilland Otters on wheels, floats, skis and even amphibious floats; but the "undercarriage" fitted to the Otter in the picture below is something quite new. So are the enormous wing flaps hanging down from the trailing-edge of the inboard half of each wing. They give a clue to the job for which this particular machine was built. Under a contract from the Canadian Defence Research Board, de Havilland have been using the Otter for STOL (short take-off and landing) experiments. To increase its lift, the aircraft was fitted with large flaps of special design, a highly-cambered leading-edge on the outer half of each wing, a boundary layer control system, and a new tail with a taller square-cut fin, vee tailplane and slotted elevators.

To find out how the result behaved, without risk to its crew, the aircraft was mounted on the high wheeled trestle shown in the illustration on this page and towed along a runway at 40 m.p.h. by an Army truck. It



The de Havilland Otter used for short take-off and landing experiments as described on this page. Illustration by courtesy of de Havilland Aircraft of Canada Ltd.

was far enough from the ground to give a clear indication of what would happen during take-off and landing, and the trestle was fitted with devices to measure the aircraft's lift, drag and pitching movement, as well as a hydraulic jack to raise and lower the tail while the rig was being towed.

The experiment seemed so promising that the Otter was taken off the trestle and fitted with a special four-wheel undercarriage which looked rather like a pair of short floats with a wheel at each end. Flight trials showed that it remained under perfect control when flown at only 42 m.p.h. and needed a landing run of under 70 yards.

He ate excess baggage

As most of you will know, air travellers are allowed to take with them a certain weight of luggage without charge. If their baggage exceeds this amount, they have to pay extra.

An airline passenger at Atlanta Airport, U.S.A., found a neat answer to this problem recently. When told that his luggage was half a pound overweight, he shrugged, opened his suitcase, took out a 2-ft.-long salami, cut off half a pound and ate it before boarding the airliner.

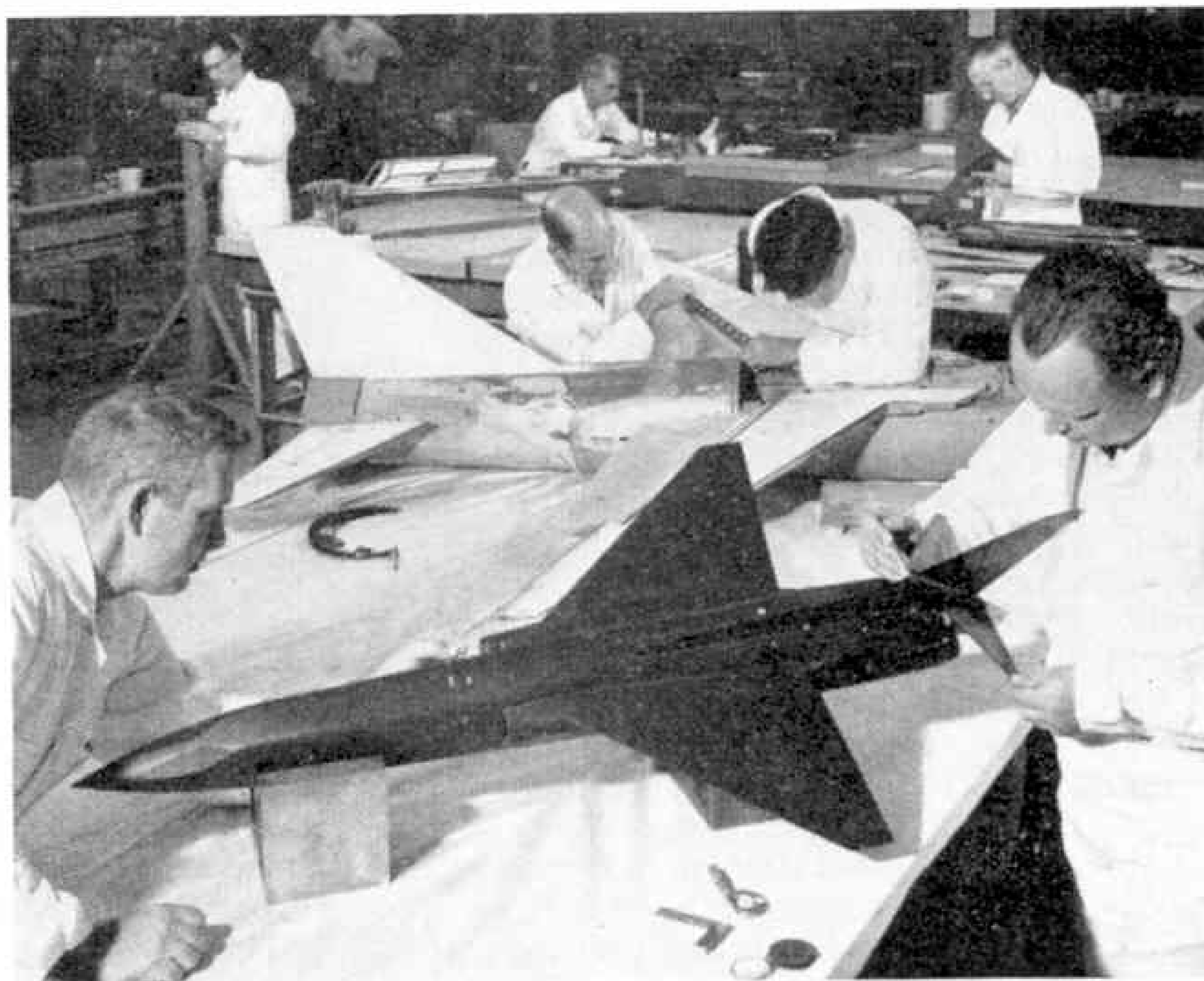
Supersonic models

If anyone tries to tell you that model aeroplanes are kid's stuff, show them the picture on this page. It depicts some of the skilled craftsmen in the Boeing model shop at Wichita, Kansas, without whose precise workmanship test pilots would have a far more dangerous life.

Long before an aeroplane flies, even before work is started on the prototype, scale models of the design spend hours under test in wind tunnels. Delicate instruments measure lift, drag and controllability at all speeds from standstill to supersonic flight. Any feature which could cause trouble on the full-size aircraft is usually brought to light and corrected.

A big advantage of model tests is that design changes can be made and tested

quickly, and Boeing modellers have to produce about 200 models a year to keep pace with demands. Most are used in wind tunnels, but some are free flight models with their own power plants and correct in every detail, down to working control surfaces, retractable wheels and a structure that is to scale not only in shape but in strength. It might seem heartrending to drop such a model from 40,000 feet and put it into a supersonic dive so that it can radio



Skilled craftsmen at work in the model shop at the Boeing company's Wichita, Kansas, plant. The scale models produced are used for design research.

back data on aileron flutter before smashing itself to pieces on the ground; but it is a lot less costly than leaving new ideas to be tried out on the piloted prototype.

X-15 exceeds Mach 3

By the time this issue of the *M.M.* is printed, the North American X-15 rocket-powered research aeroplane should have proved itself the fastest piloted aircraft ever built. During a test flight on May 12, Joe Walker, of the National Aeronautics and Space Administration, reached a speed of Mach 3.2 (or 3.2 times the speed of sound), which is equivalent to 2,074–2,148 m.p.h.

The X-15 flown by Walker was powered by two "interim" engines developing only 16,000 lb. of thrust. The third prototype has a 57,000 lb. rocket-motor which is intended to make possible a speed of at least 3,600 m.p.h. at heights up to 100 miles.

HOUSES ON THE MOVE

By R. J. Salter

CANADA is a country where they do things in a big way. It is a country of vast distances and wide open spaces.

The huge inland seas known as the Great Lakes and the impressive Niagara Falls between Lakes Erie and Ontario must have astounded the first European discoverers. When first seen by the explorers, they were in country inhabited by hostile Indians. Today, this part of Canada and the United States contains some of the biggest industrial plants in the world.

Modern machinery and modern homes need a great deal of electricity and both Canada and the United States have produced it in the cheapest way. They have made use of the great drop in water level at the Niagara Falls by building huge generating stations into the almost vertical walls of the Niagara gorge.

Another way in which the two countries have shared in making electricity is by using the same water, this time when it flows through the St. Lawrence River. In the last few years tremendous new dams and water canals have been built along the St. Lawrence River so that, today, vast ocean-going liners can sail right into the heart of the United States to Chicago.

Building these great engineering works has meant that the course of rivers has been changed, and lakes have been formed where towns were before. In some cases people have had to leave their homes, notably in the case of the small town of Iroquois, close to the banks of the St. Lawrence River, which is now under water.

Fortunately, when houses are erected in this part of the world a great many are built of timber, or else have a very strong framework of timber and steel on which the bricks are placed when the house is being built.

Canadian and American engineers, taking advantage of this, have been moving buildings from one place to another.



This church, as well as houses, was moved above the rising waters of the St. Lawrence River.

First of all the house is sliced off from its foundations. It is done piece by piece so that steel beams can be slid beneath. When this part of the job has been completed the house rests on the steel beams, which, in turn, rest upon the old house foundations.

These old foundations are carefully measured up and exactly similar ones are built at the new site. All is now ready for the move. Jacks are placed under the steel beams and the house is slowly lifted up clear of the foundations.

Large wheels are then fastened on to the steel beams and the jacks then lower the whole house until it is supported on the wheels. The house is then pulled to the new site by a powerful tractor or truck, when it is lowered on to the new foundations.

So many houses have been moved that two special house-moving machines have been constructed, one capable of lifting up to 200 tons and the other able to lift 100 tons. Both are electrically operated from diesel-driven generator units incorporated in the machine. Large pneumatic wheels, with a diameter of 10 feet and a width of 3 feet, used on the rear of the machine, allow the heavy loads to be carried in safety, absorbing any shocks that take place during transit.

As before, the first operation in moving a house is the construction of a steel frame

(Continued on page 431)



Historic herd from far-off days

BRITAIN'S LAST WILD CATTLE

By Arthur Turner

ONE of the most unique herds of cattle in the world roams a 600-acre estate in the Cheviot Hills of Northern England. Nowhere else in Britain today will you find completely wild cattle living in natural surroundings and fending largely for themselves.

Until the middle of the last century a few other herds of this kind survived at different places in England, but the cattle at Chillingham, near Alnwick, Northumberland, are now the only ones left.

At the present time they number 28, including a calf born last February, and they have the freedom of Chillingham Park.

Entirely undomesticated, they are descended from the wild herds of centuries ago, and they have never been crossed with domestic cattle.

Roman legions marching through Britain 2,000 years ago must have startled many such herds browsing by the roadside, and earlier still these white cattle figured in Druidical rites. The British Whites, as they are called, were themselves descended from the ancient aurochs, the massive black oxen which roamed Europe and Asia in prehistoric times.

Illustrated above are the unique Chillingham wild cattle whose ancestors are believed to have been walled in when the estate was enclosed 700 years ago.

White auroch calves were sometimes born, and these were regarded as sacred. They were protected by the Druids, and formed the nucleus of the British white cattle from which have come the few wild herds of modern times.

How the Chillingham herd came to survive is an absorbing story. The British Whites began to die out in the Middle Ages, when breeds similar to the farm cattle of today were developed. In spite of their

hardiness, the wild herds could not compete with the highly productive domesticated breeds, and in consequence their numbers rapidly

declined. But in Northumberland circumstances enabled some to survive. About 700 years ago the Chillingham estate was surrounded by a wall to keep out Scots raiders, and a few wild cattle remained inside the barrier.

Historians have been unable to determine with certainty whether the animals were accidentally confined, or whether they were deliberately walled in to provide beef for Alnwick Castle, ancestral home of the Earls of Tankerville.

By coralling a number of wild cattle in those days the local food situation would have been eased. At the same time, being extremely fierce the cattle could not have been driven away by raiders and taken over the Border, as their domestic cousins were.

Ever since that time there has been a wild herd on the Chillingham estate, sometimes totalling more than eighty bulls, cows and calves. The herd totalled 82 in 1913, and although from time to time there have been fears for its survival, the threat of complete extinction has always been avoided.

Between 1946 and 1947 the number declined from 34 to 13, Arctic weather causing this alarming reduction. Normally the cattle forage for themselves, but for several weeks they were without natural food and deep snow prevented fodder being taken to them.

Battled through snowdrifts

In an attempt to meet the situation 'planes were chartered and loaded with bundles of hay which it was intended to drop near the animals. But weather conditions did not allow the aircraft to take off, and when, eventually food was carried to the herd by estate workers who struggled through the snowdrifts, it was found

The King—one bull definitely assumes leadership of the herd and maintains it until ousted, at the challenge of another, by sheer strength.

that many of the cattle had died.

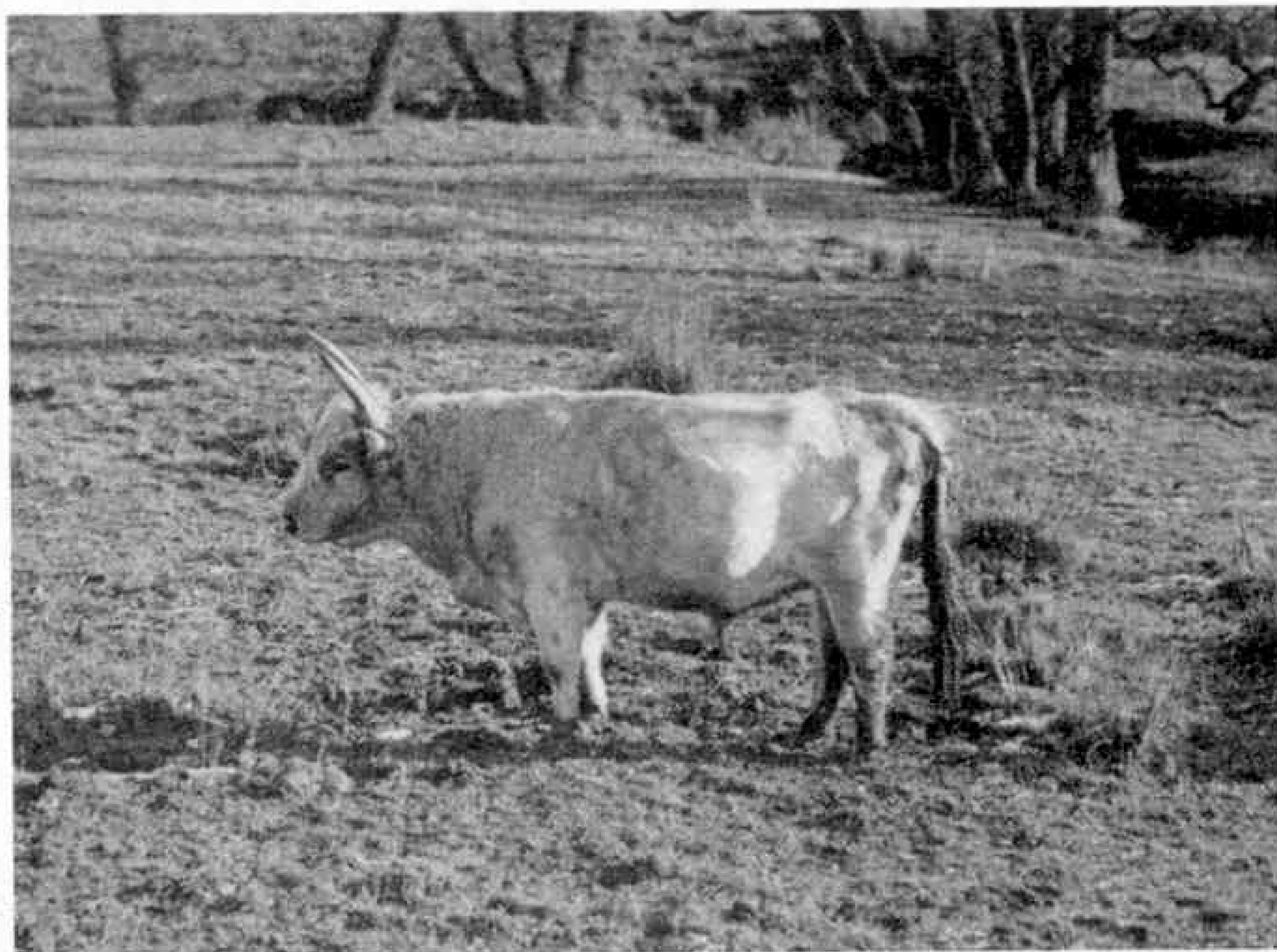
Fortunately, such adverse weather has not occurred again, and the herd has had a better chance to build up. The calf born in February this year replaces a bull which died a natural death on the same day, and the present total is as high as it has been at any time since the disastrous winter of 1946-1947.

The cattle have several characteristics which domesticated ones do not display. The shape of their skulls differs from that of domestic cattle, and the black-tipped horns grow out like those of the ancient aurochs.

The Chillingham beasts are also the only white park cattle which invariably breed true to type. They have never been known to include a coloured or partly-coloured calf. The only difference between the wild cattle at Chillingham today and those of hundreds of years ago is that the present animals are slightly smaller. Old skulls found in the park have shown this to be the case.

The most extraordinary custom of the herd is their choice of a king bull as leader. This animal is always the strongest and fittest, and he leads the herd only until another bull successfully challenges him.

When the king bull is to be challenged, his rival comes out a little way from the herd and starts to bellow, pawing the ground at the same time. If the king accepts the challenge he, too, leaves the herd and goes through the same ritual. Suddenly, a sharp attack is launched, and although this may last less than a minute it is repeated between intervals of grazing, during which each bull tries to catch the other off guard. The short rounds increase in intensity until one animal



admits defeat and slinks away into temporary banishment. He lives for a time away from the herd, and during this period he is usually irritable and dangerous.

All the Chillingham wild cattle, indeed, are very difficult to approach. To get away they traverse the hollows like red deer, and they always move rapidly in single file with the king bull in the lead. But, if danger threatens, he takes the rear.

If alarmed the herd stampedes, but the cattle eventually return in ever-narrowing circles to investigate the source of their fear. Newborn calves are hidden in the undergrowth or in a secluded corner, and

herd is also shown by the animal's feeding habits, which differ from those of domestic cattle. The wild cattle will not eat out of boxes, even in the open; nor will they touch oats or processed cattle foods. They have

never been known to eat anything except grass, hay, or straw. Cattle nuts and oats left out for them in open boxes during severe weather have gone unheeded. This happened during the 1946-1947 winter, in spite of the fact that many of the animals were starving. Although some died through falling into snow drifts overhanging a stream in Chillingham Park, others perished from lack of food, failing to eat the fodder put out for



The Chillingham herd grazing peacefully on the 600-acre estate at Alnwick.

they crouch like a hare when discovered. They are fed only at night, and sleep or bask during the day.

The herd have a remarkable introduction ceremony for a calf which has grown big enough to accompany the adult animals. The calf is brought to the herd by its mother, and is allowed to join the others only after it has been accepted by the king bull.

Any calf caught and handled by man, however, is not only rejected, or banished if it has already been accepted, but is killed by the herd. For this reason it is impossible to remove ailing calves and return them to the herd after treatment.

In point of fact, these wild cattle never suffer from infectious diseases, perhaps because they are not interfered with by man, and oddly enough the duels for leadership rarely result in the contesting bulls being seriously injured. Seldom is a bull mortally wounded in such a fight, although this did happen in 1939. On that occasion a temporarily banished bull returned to challenge the reigning bull again, instead of quietly rejoining the herd after a period of exile. This the king bull would not tolerate and, with the help of another bull, the challenger was killed.

The true character of the Chillingham

them.

The herd is so unique that it has been the subject of close studies by experts from several countries. Learned zoologists have gone to Chillingham to expand their knowledge.

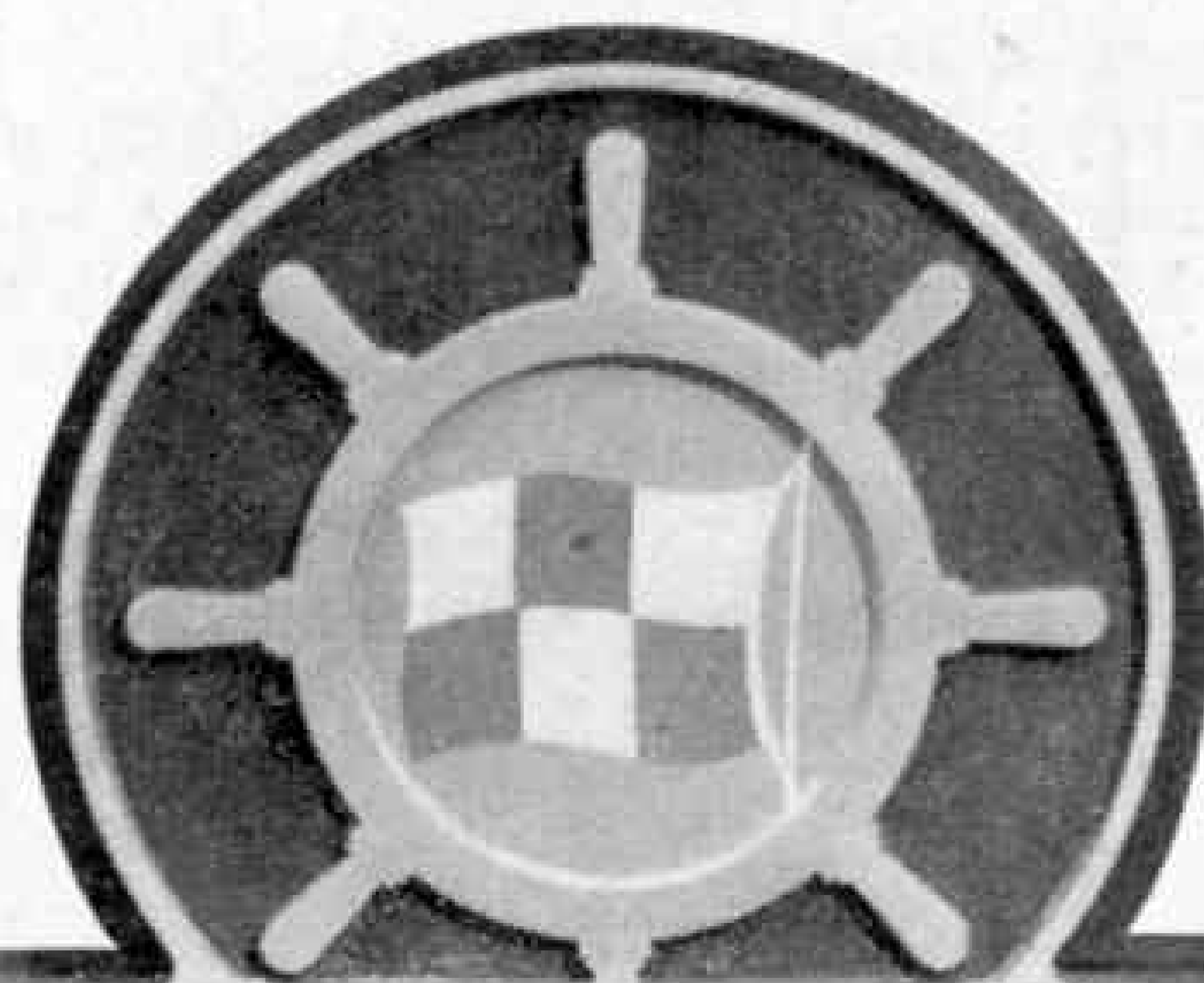
Preserving the herd

It is hardly surprising that steps have been taken to preserve the herd. This ancient race of cattle in Northumberland provides an interesting illustration of the evolution of domestic cattle, as well as having great historical importance, and it would be a great pity if it were allowed to disappear completely.

There used to be wild cattle in Lyme Park, Cheshire, at Gisburn, Yorkshire, and at Cadzow and Kilmory, in Scotland, but these were slaughtered or were dispersed. Since early 1939, however, the Chillingham herd has been maintained by a non-profit-making organisation formed by the Earl of Tankerville and supported by interested members of the public.

The herd is also becoming more and more widely known as a tourist attraction, and several thousand visitors have journeyed to Chillingham to see its famous cattle.

TYPE 4
DIESEL
WITH



FAMOUS
SHIP'S
NAME



THE photograph at the top of this page is a close-up of the nameplate of *Empress of Britain*, the 2,000 h.p. Type 4 diesel-electric locomotive No. D210, recently named after the famous Canadian Pacific trans-Atlantic liner.

The naming ceremony, at Euston Station, was performed by Mr. N. R. Crump, President, Canadian Pacific, who joined that company in 1920 in the Motive Power Department in his native town of Revelstoke. A man of wide interests he has been the driving force behind the change-over in Canadian Pacific's locomotive power from steam to diesel. Before the end of this year motive power throughout their network will be supplied completely by diesel locomotives except at peak periods.

Presiding at the naming ceremony was

"*Empress of Britain*", seen here on the occasion of the naming ceremony, carries an "*Empress Voyager*" headboard. Both pictures on this page are British Railways Official Photographs.

Mr. David Blee, General Manager, London Midland Region, British Railways, who said that Type 4 diesels now hauled the principal express trains between Euston and Liverpool. It was a fitting tribute to the Port of Liverpool that the locomotives should carry the names of some of the famous vessels that had used, and still were using, that great port.

Empress of Britain is one of a large number of diesel-electric locomotives designed for the British Transport Commission.

FOR THE RECORD

"*Empress of Britain*" was built by the English Electric Company at the Vulcan Foundry, Newton-le-Willows. Here are some details about the locomotive:

Length over buffers	69 ft. 6 in.
Total weight in working order ..	133 tons
Driving wheel diameter ..	3 ft. 9 in.
Maximum tractive effort ..	52,000 h.p.
Fuel capacity	700 gallons, diesel fuel.



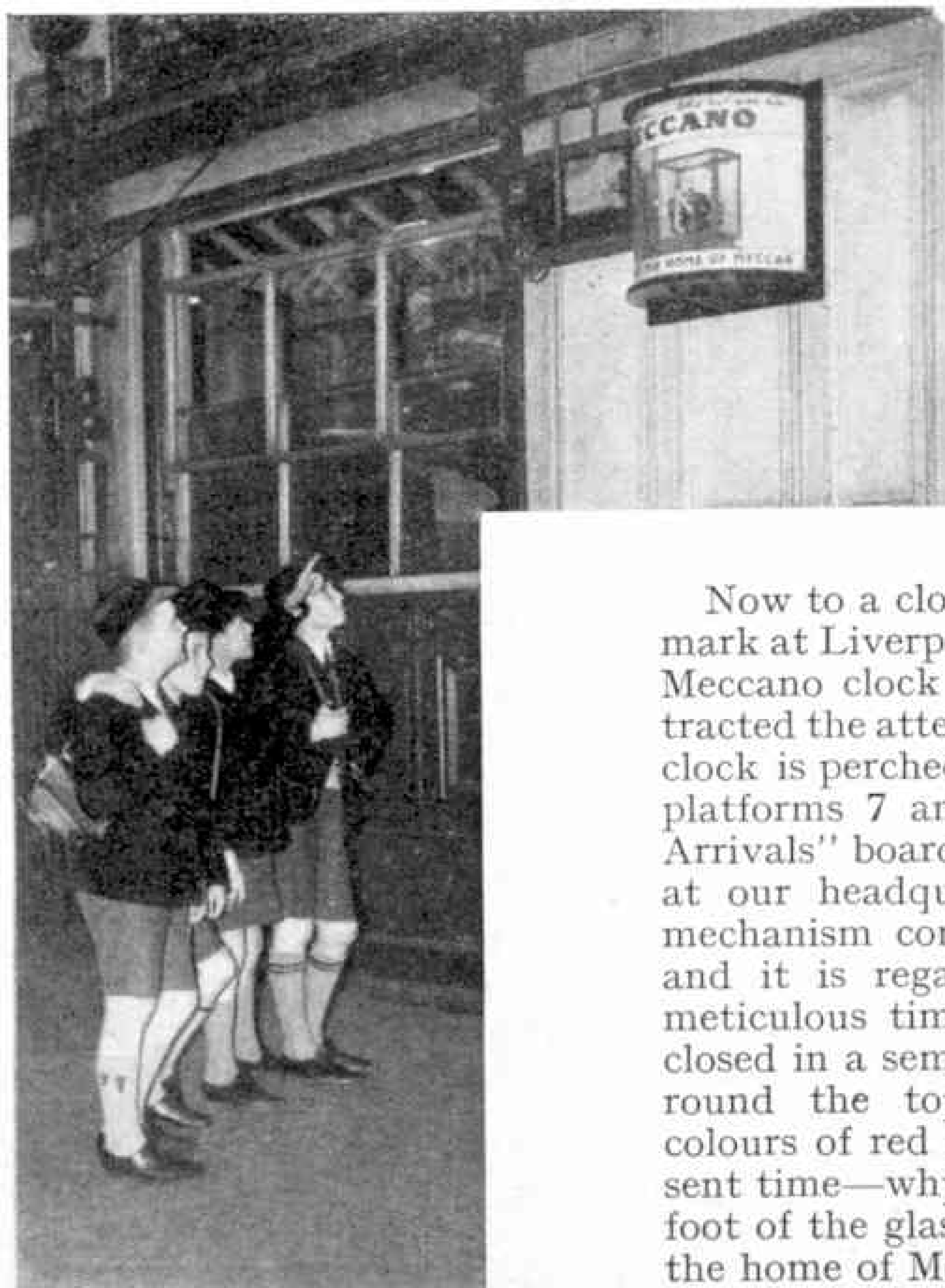
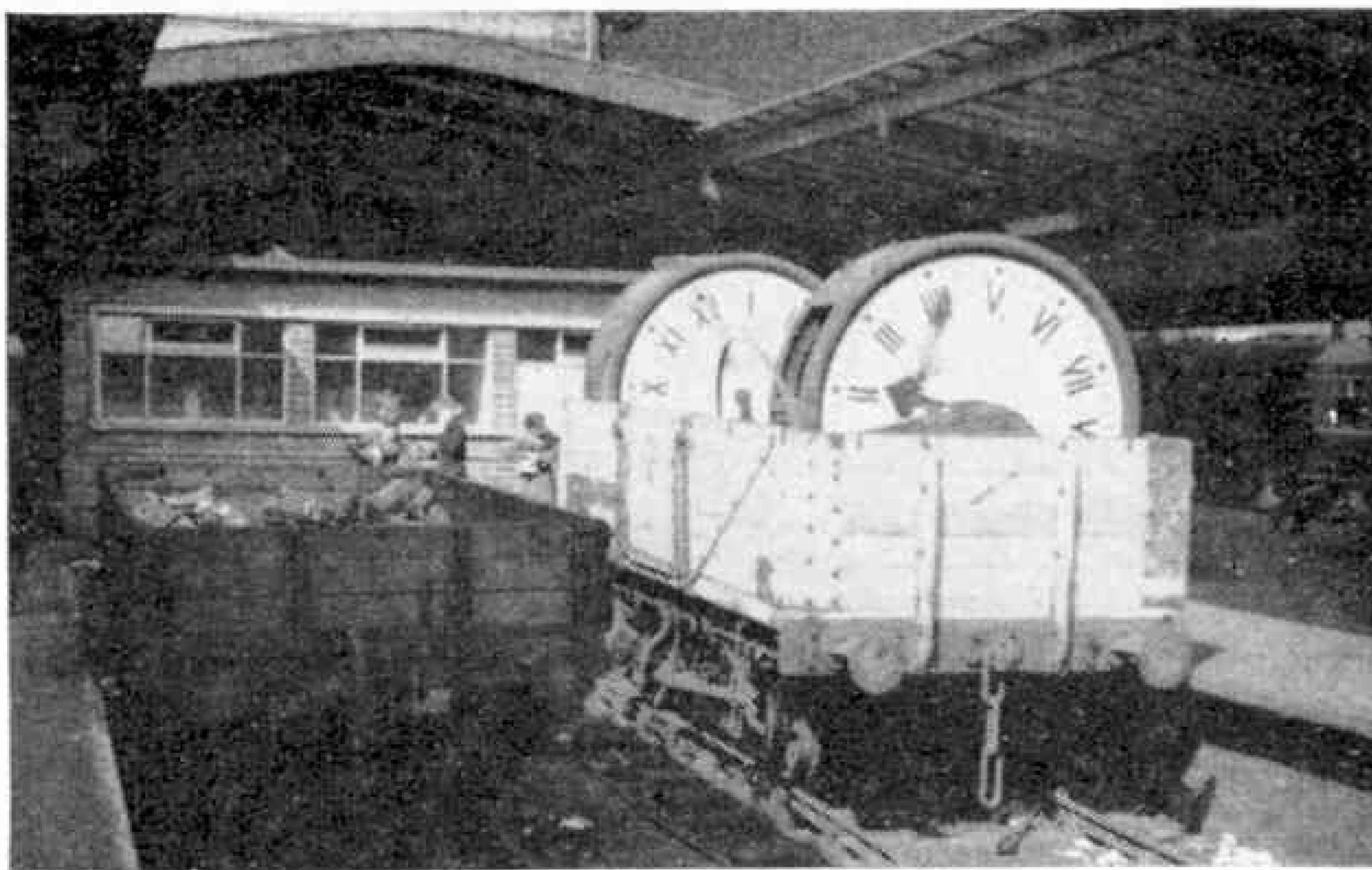
MECCANO MAGAZINE

EIGHT-PAGE

Junior Section

Moving the Clocks!

WE have a page of clocks for your enjoyment this month. Large clocks have been a familiar feature of railway stations for many years and some, such as those used by the former London and North Western Railway, were massive in construction. The picture on the right shows two such clocks in an unusual position and their sizes can be judged by comparing them with the wagon in which they are placed.



When the clocks were photographed at Preston Station earlier this year, they were consigned to the British Railways clock and watch department at Manchester. The clocks have now been replaced by smaller ones as part of the re-construction of the station. Similar large clocks can be seen at other main line stations, although their days of service are now probably numbered. So passes another link with the earlier days of railways.

Now to a clock which is fast becoming a landmark at Liverpool's Lime Street Station. It is the Meccano clock pictured here and which has attracted the attention of four young travellers. The clock is perched high up on the wall adjacent to platforms 7 and 8, and is close to the "Train Arrivals" board. Made in the Model Department at our headquarters here in Binns Road, its mechanism consists entirely of Meccano parts, and it is regarded by the station staff as a meticulous timekeeper. The clock itself is enclosed in a semi-circular glass case which carries round the top, in the well-known Meccano colours of red and yellow, the words, "It's present time—why not give him Meccano?" At the foot of the glass case is the legend "Liverpool is the home of Meccano."

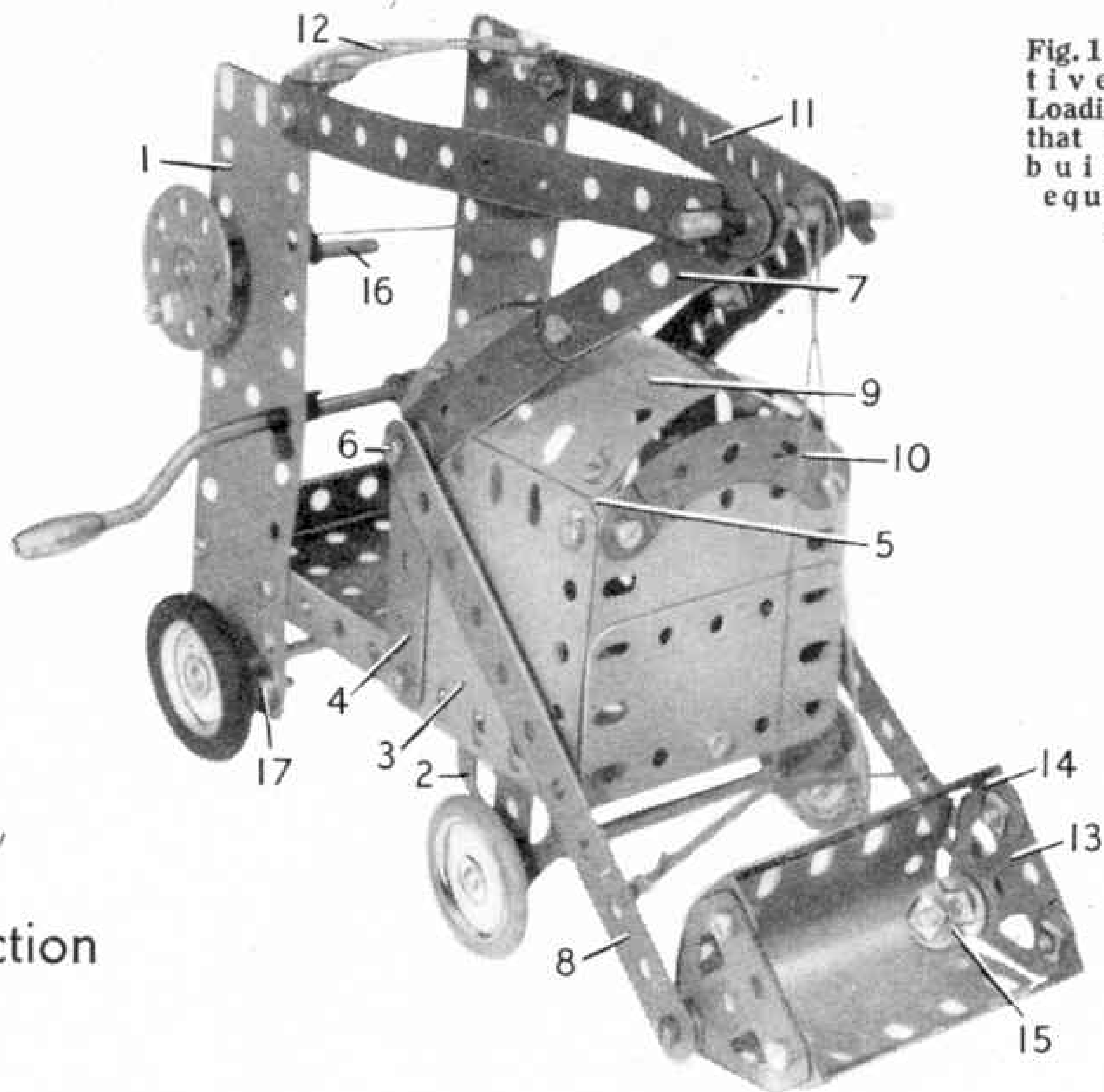


Fig. 1. An attractive model Loading Shovel that is easy to build and equires few parts.

"Spanner's"
Special Section
for Juniors

Easy Model-Building

Loading Shovel

TO build the model Loading Shovel shown in Fig. 1 take a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate and to one end of it bolt two $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates 1 and at the other end attach two Trunnions 2. A $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 3 is then bolted to the Flanged Plate on each side, one of the bolts also securing a $2\frac{1}{2}"$ Perforated Strip 4. Obtuse Angle Brackets 5 are attached to the Plates 3, one of them being held by a $\frac{3}{8}"$ Bolt 6 on each side. This Bolt secures a $4\frac{1}{2}"$ Strip 7, made up of two $2\frac{1}{2}"$ Strips, Strip 4 and a $5\frac{1}{2}"$ Strip 8, the latter being spaced from Strip 4 by one nut. A Curved Plate 9 is attached to the Obtuse Angle Brackets to form the top of the engine housing. The front of the housing is filled in with two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates and a Stepped Curved Strip 10. Two $5\frac{1}{2}"$ Perforated Strips 11, slightly bent as shown, and two Angle Brackets, are attached by the same bolts to the Flexible Plates 1, which are braced by a Stepped Curved Strip 12 bolted to the other lugs of the Angle Brackets. A 2" Rod is journalled in the ends of the Strips 7 and 11

and held in place by Spring Clips.

The digger bucket is made of two Flat Trunnions 13 joined by $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 14. A "U"-shaped Curved Plate is bolted to Angle Brackets 15 secured to the apex holes of the Flat Trunnions by $\frac{3}{8}"$ Bolts, which also attach the shovel to the Strips 8. The bucket and the Strips are separated by a Washer and a nut. Cord attached to the bucket passes over the 2" Rod and is secured to a $3\frac{1}{2}"$ Rod 16, which passes through the Plate 1 and a Reversed Angle Bracket bolted to it on the inside. The Rod is fitted with a Bush Wheel for a handle. Similarly, Cord tied to the Strips 8 is fastened to an Anchoring Spring carried on a Crank Handle supported in the Plates 1. The rear axle of the chassis is supported in Fishplates fixed by Bolts 17 to each of these Plates.

Parts required to build the Loading Shovel:
4 of No. 2; 6 of No. 5; 2 of No. 10; 4 of No. 12; 4 of No. 12c; 2 of No. 16; 2 of No. 17; 1 of No. 19g; 4 of No. 22; 1 of No. 24; 4 of No. 35; 46 of No. 37a; 38 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 4 of No. 111c; 1 of No. 125; 2 of No.

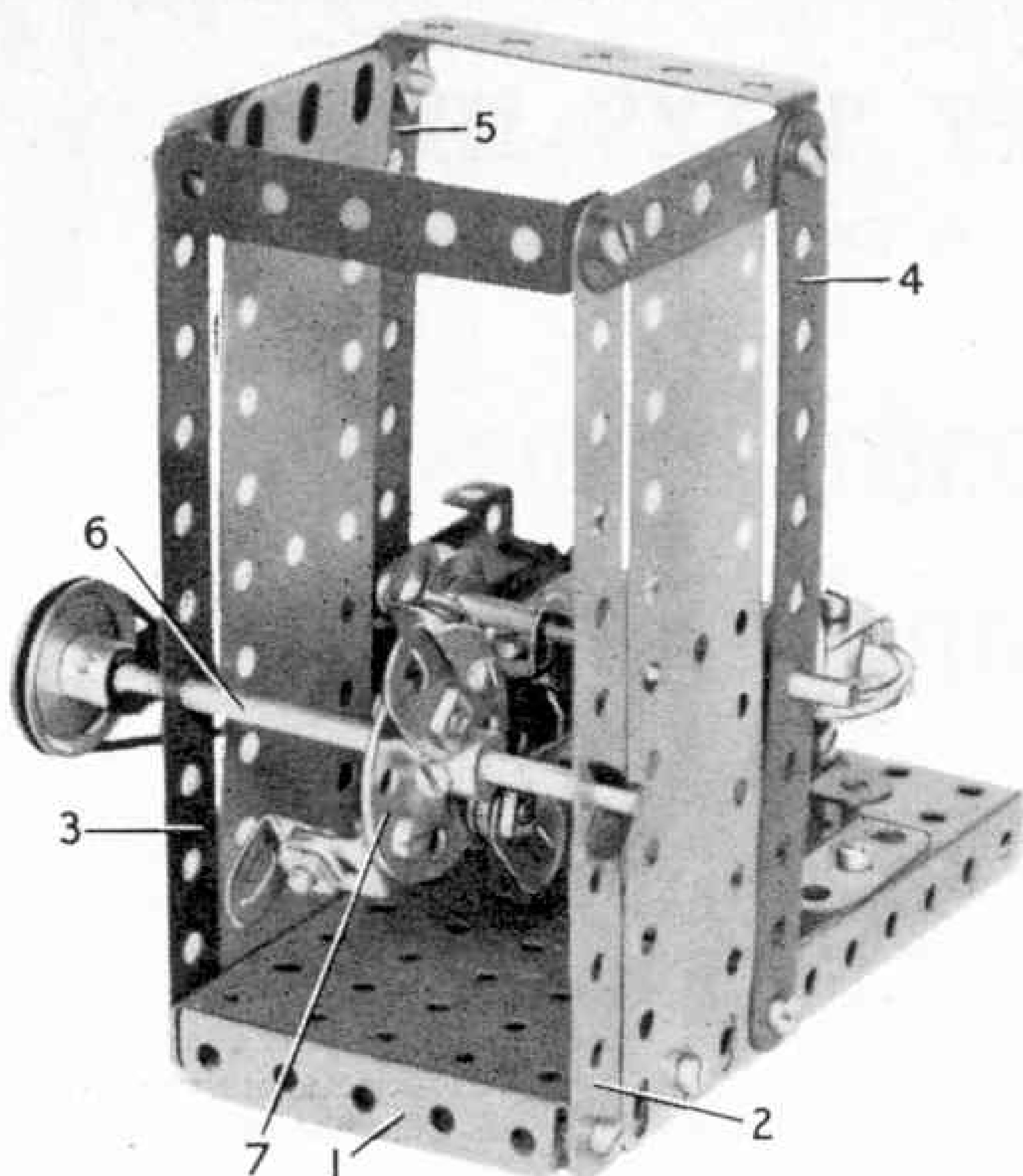


Fig. 2. A novel Mechanical Hammering Machine equipped with twin hammers.

126; 2 of No. 126a; 2 of No. 142c; 2 of No. 155; 1 of No. 176; 2 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 199; 1 of No. 200.

THE MECHANICAL HAMMER

In the end holes of the $5\frac{1}{2}$ " Flanges of Flanged Plate 1 (Fig. 2) two $5\frac{1}{2}$ " Strips 2 and 3 are bolted. Two further $5\frac{1}{2}$ " Strips 4 and 5 are bolted $1\frac{1}{2}$ " from Strips 2 and 3, the space between the Strips 2 and 4, and 3 and 5 being filled by two $5\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plates. The Strips 2 and 4, and 3 and 5 are joined at their top holes by two $2\frac{1}{2}$ " Strips, the same bolts being held by nuts in the lugs of two $2\frac{1}{2} \times 1\frac{1}{2}$ " Double Angle Strips which connect the Strips 2 and 3, and 4 and 5, across the back and front.

A $3\frac{1}{2}$ " Rod 6 bears in the Strips 2 and 3, and is held in place by Spring Clips. At one end a 1" Pulley Wheel is fixed, with a driving band passed around it and the *Magic Motor*, which is bolted to the flange of Flanged Plate 1. An 8" hole Bush Wheel 7 is also fixed on the Rod 6. This Bush Wheel 7 has four cams bolted around its circumference. Two of them are Fish Plates held by nuts on a $\frac{3}{8}$ " Bolt, each being spaced from the Bush Wheel 7 by a nut and three Washers. The other two cams are each formed of two Angle Brackets

bolted together, and then bolted onto the Bush Wheel 7. These two pairs of cams are fixed in such a way that two strike on the end of a $2\frac{1}{2}$ " Strip 8 (Fig. 3), while the other two strike the end of another similar Strip 9. Both the Strips 8 and 9 are pivoted side by side on a $3\frac{1}{2}$ " Rod by means of Angle Brackets, two of which are bolted through their elongated hole to the $2\frac{1}{2}$ " Strips 8 and 9. A $\frac{1}{2}$ " Pulley with Boss and a 1" Pulley Wheel are used to hold the $3\frac{1}{2}$ " Rod in place in its bearings in Strips 4 and 5.

In the end holes of the two Strips 8 and 9, Fishplates are bolted, and $\frac{3}{8}$ " Bolts are passed through the elongated holes of the Fishplates into the bosses of two 1" Pulley Wheels. These Pulley Wheels strike upon two Flat Trunnions 10 and 11, which are overlapped two holes and bolted together through the apex holes.

To Flat Trunnion 10 a Reversed Angle Bracket is bolted by one lug. This Reversed Angle Bracket is then fixed in the apex hole of one of the two Trunnions bolted one each side of the Flanged Plate 1.

When the *Magic Motor* is wound and set in motion, the cams on the Bush Wheel strike each of the hammers alternately, at every quarter turn. Thus (Continued on page 431)

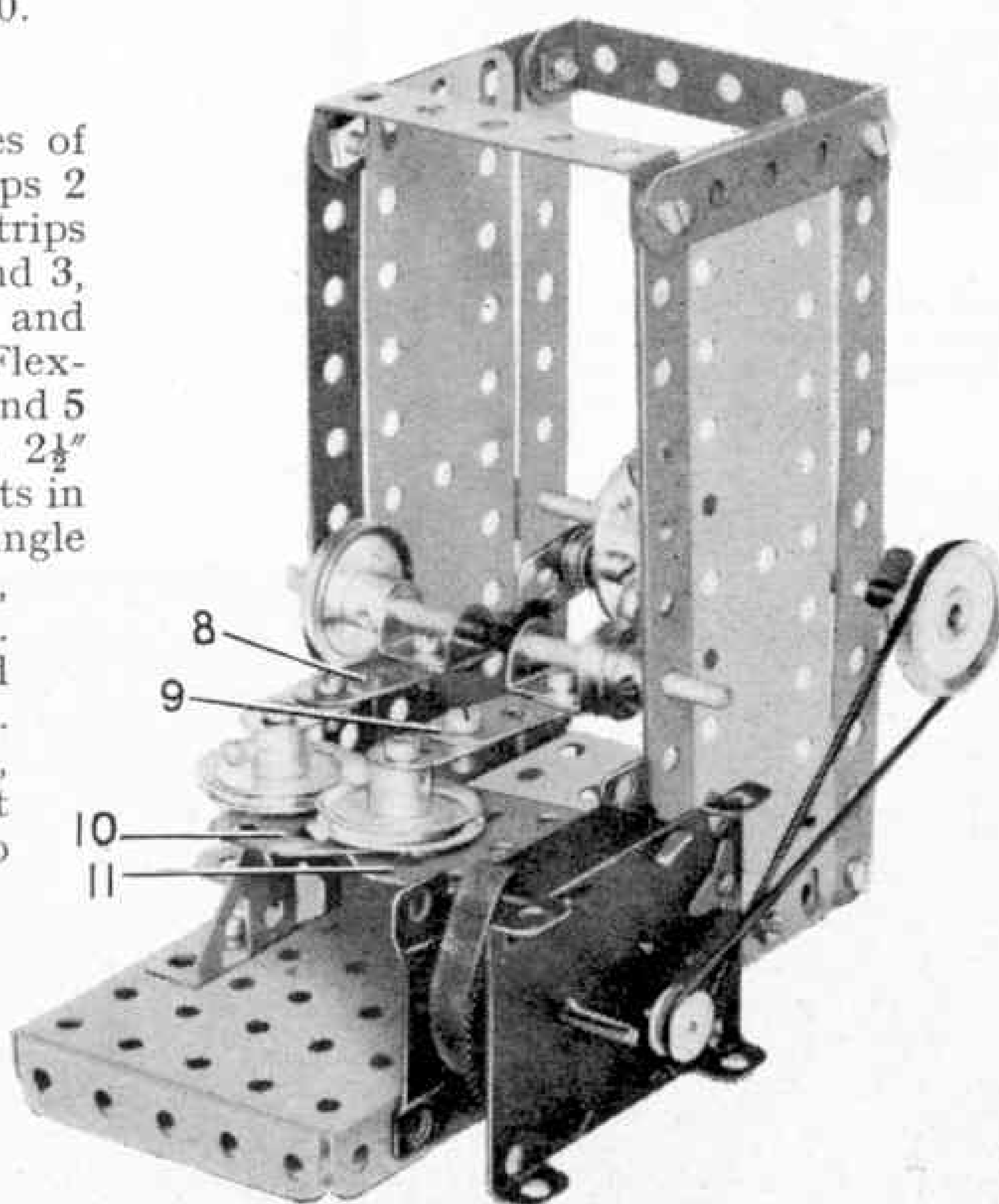


Fig. 3. Another view of the Mechanical Hammer.



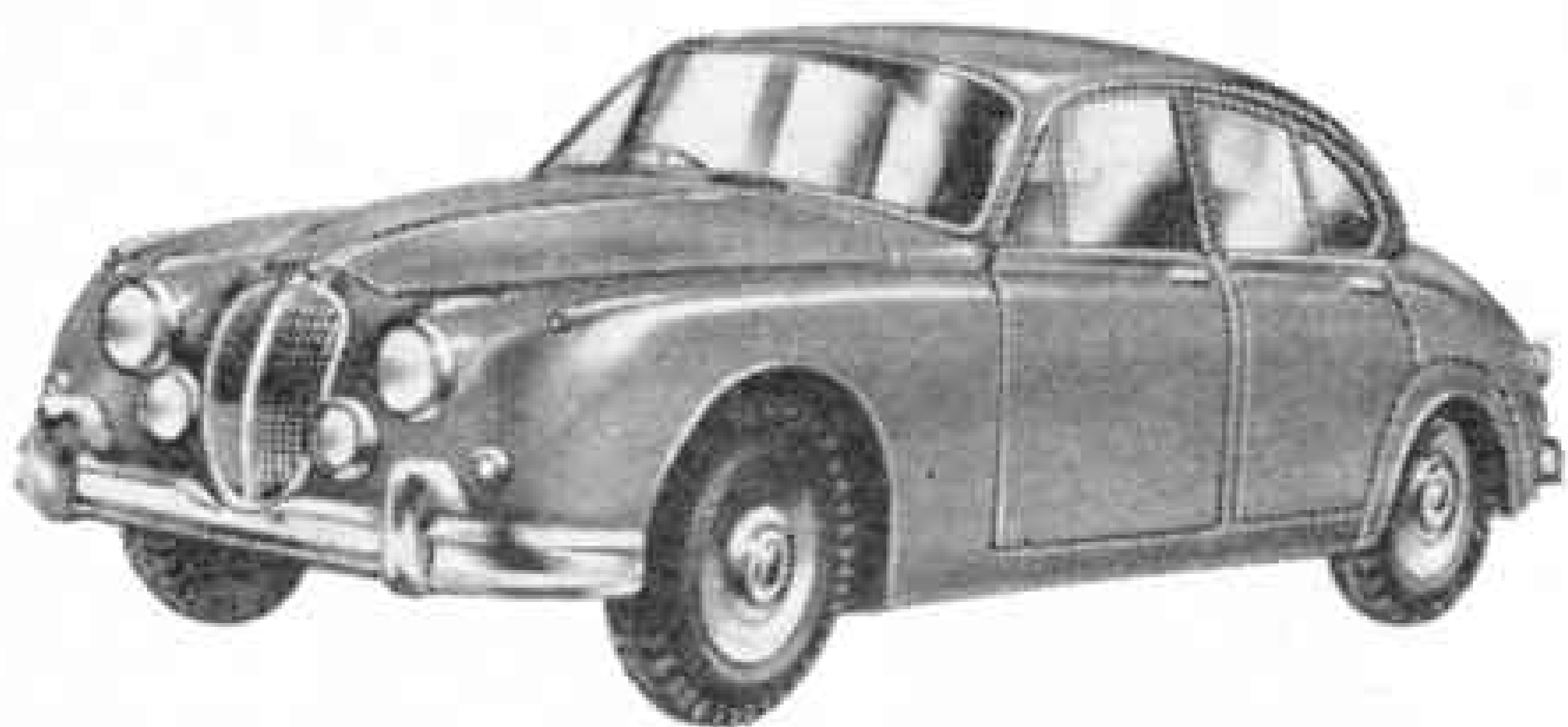
DINKY TOYS NEWS

By THE TOYMAN

Directional Control Brings a New "Driving" Thrill

ALL Dinky Toys collectors will, I am sure, be thrilled and delighted with the clever device fitted to the latest of these popular models. It is called Directional Control, and it is used for the first time on the Jaguar 3·4 Sports Saloon which has recently appeared in the shops.

With this very special feature Dinky Toys offer their "drivers" the exciting prospect of controlled motoring. In effect,



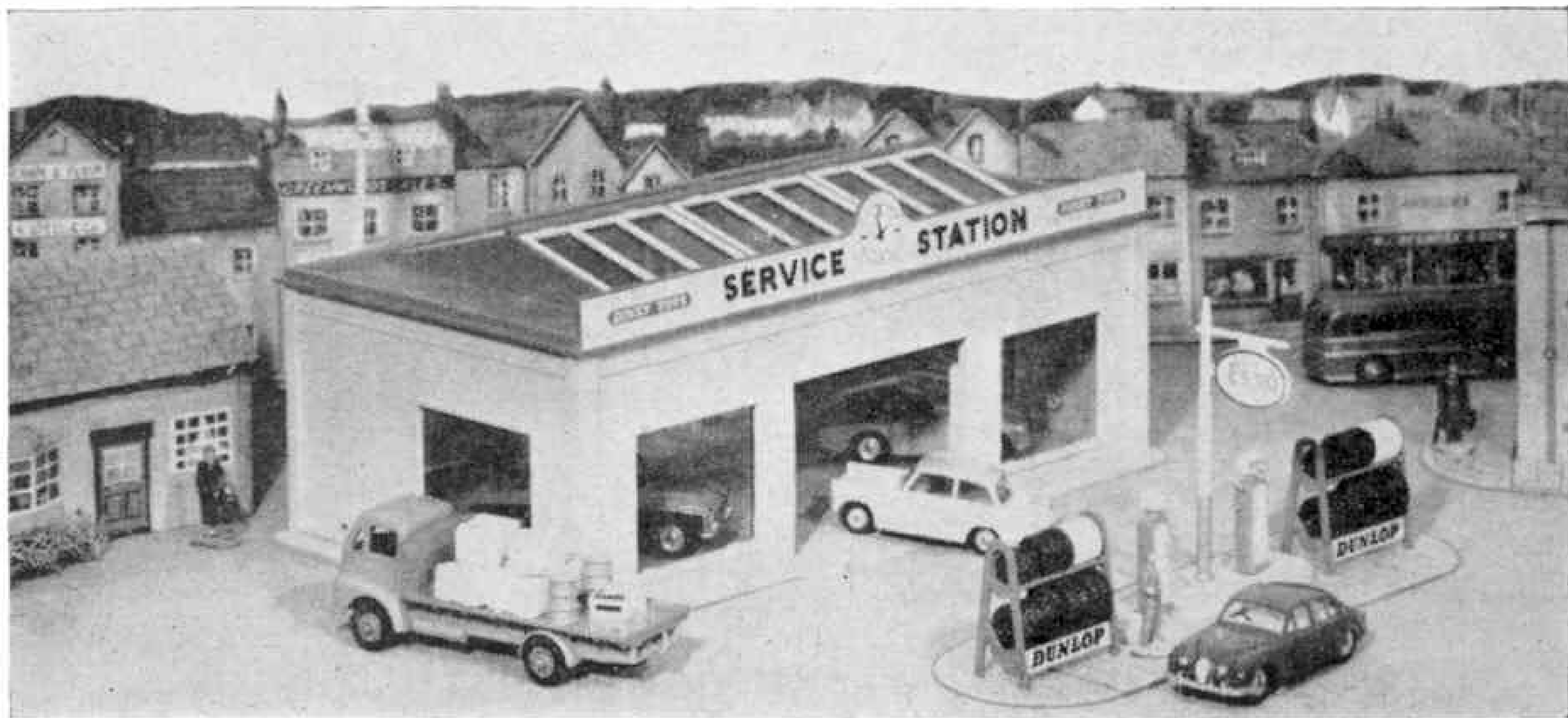
Latest addition to the Dinky Toys range of cars is the Jaguar 3·4 (above). In the picture below the new model is moving to a halt by the Esso Petrol Pumps outside a Dinky Toys Service Station.

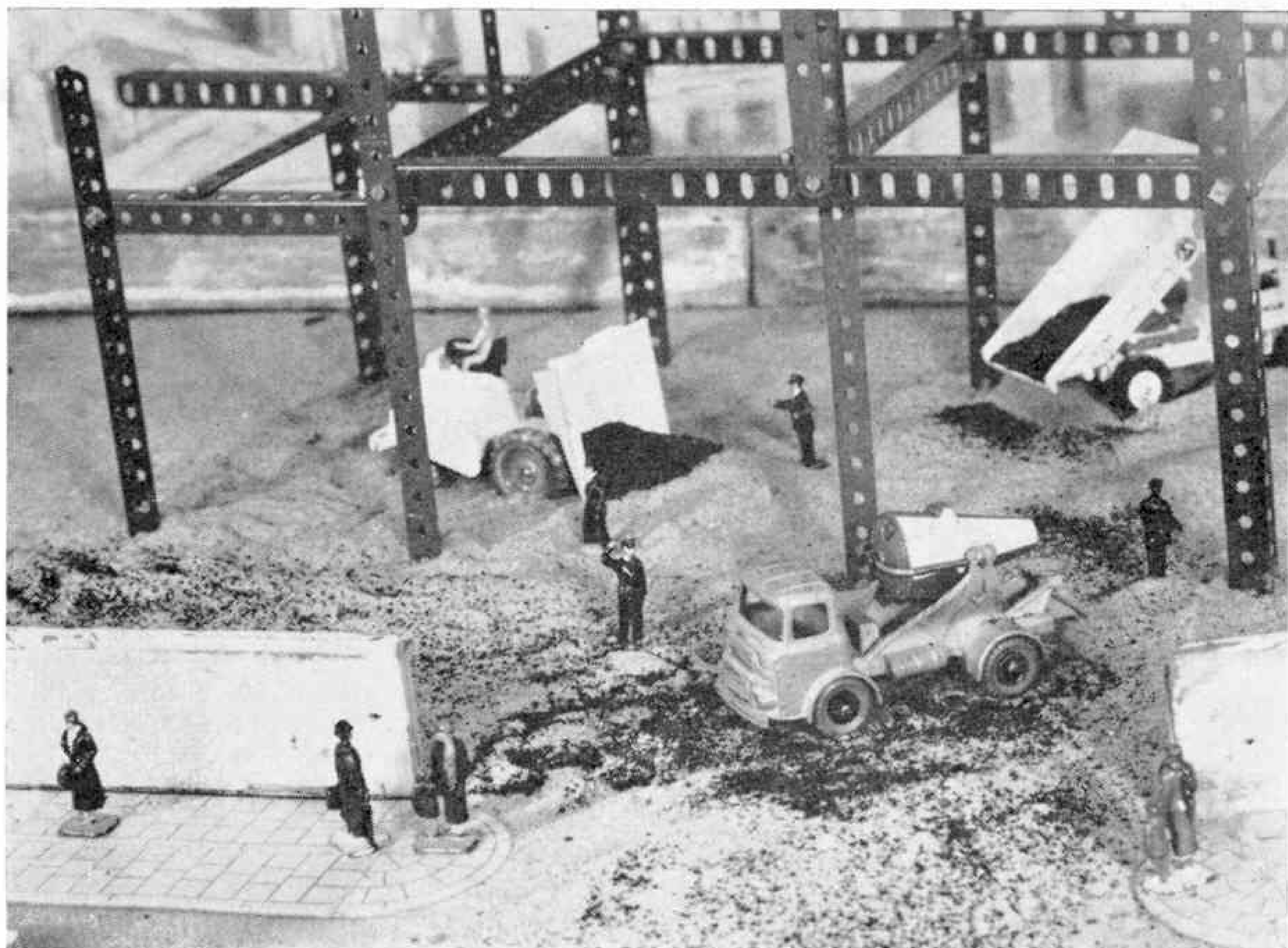
Directional Control means fingertip steering. The Jaguar 3·4 has four-wheel suspension similar to that fitted to several recent models but, in addition, it can be steered by exerting slight pressure with the fingers on the top of the car. Pressure on the right will move the car in that direction; pressure on the left turns the model that way.

"Parking" your vehicles

In these days of crowded car parks, the driver of a real car often has to shuttle backwards and forwards with first "Right hand down" then "Left hand down" before he can ease (or should it be squeeze?) his car into the space available. You can imagine what enjoyment you will be able to get from manoeuvring your new Jaguar, in similar manner, into a line of "parked" Dinky Toys.

The new Dinky Toys Jaguar is also fitted with seats, windows and steering wheel (which is there to add to the air of realism, but which does not operate the steering).





The wheels are silver plated and the model is finished in two colours: cream body with red interior, and maroon body with cream seats. It is No. 195 in the range and is priced at 3/11.

For those who are interested in the Jaguar 3.4 sports saloon itself, here are some details of the actual car:

Cubic capacity	3442 c.c.
Maximum speed	119 m.p.h.
Overall length	15 ft. 0 $\frac{3}{4}$ in.
Width	5 ft. 6 $\frac{3}{4}$ in.
Height	4 ft. 9 $\frac{1}{2}$ in.
Turning circle	33 $\frac{1}{2}$ ft.
Wheelbase	8 ft. 11 $\frac{3}{8}$ in.

Our first picture this month shows the new Dinky Toys Jaguar in a typical town centre in which use has been made of the Dinky Toys Service Station (No. 785) and sections from No. 754, Pavement Set, on which are mounted the Esso Petrol Pumps (No. 781) and two of the new Tyre Racks, which are number 786 in the Dinky Toys range. The load on the Guy Warrior Flat Truck consists of crates and other accessories made at the Meccano Works in France and now available in this country. They certainly add that "something" to such scenes as this.

In the foreground of this busy building scene is the new Dinky Supertoy Lorry-Mounted Cement Mixer, a very useful model to have for schemes of this nature.

New Cement Mixer

Now we come to another splendid new model, this time in the Dinky Supertoys range. It is No. 960, Lorry-Mounted Cement Mixer, and you see it in the photograph at the top of this page. In this scene Meccano Perforated Strips and Angle Girders have been used to represent a huge building under construction. The Muir-Hill Dumper Truck, No. 962 and No. 965, Euclid Rear Dump Truck can be seen unloading material, and the new Cement Mixer is in the foreground.

The Albion Chieftain chassis is the prototype on which the new Cement Mixer is based. The model is 5 in. in length and is finished in an attractive orange colour. The mixer itself is bright blue and primrose, and the neat system of gearing causes it to revolve as the vehicle moves backwards or forward. In addition the mixer, or bowl, can be tilted by hand to tip its contents down a chute at the rear.

The cab of the Cement Mixer is fitted with windows. The vehicle has twin rear wheels and a spare tyre is mounted in an under-slung position on the vehicle's offside.

Altogether it is a most attractive model and is ideally suited to outdoor schemes such as those I mentioned in my notes last month.

Coming available during the present month will be a commercial version of the Missile Servicing Platform Vehicle which has proved so popular in conjunction with the Corporal Missile Unit. The Servicing Arm (commercial version) will be No. 977 in the Dinky Supertoys list and the colour scheme for the model will be cream cab and chassis with the movable twin booms in red. Perhaps I could remind readers that

DINKY RHYMES



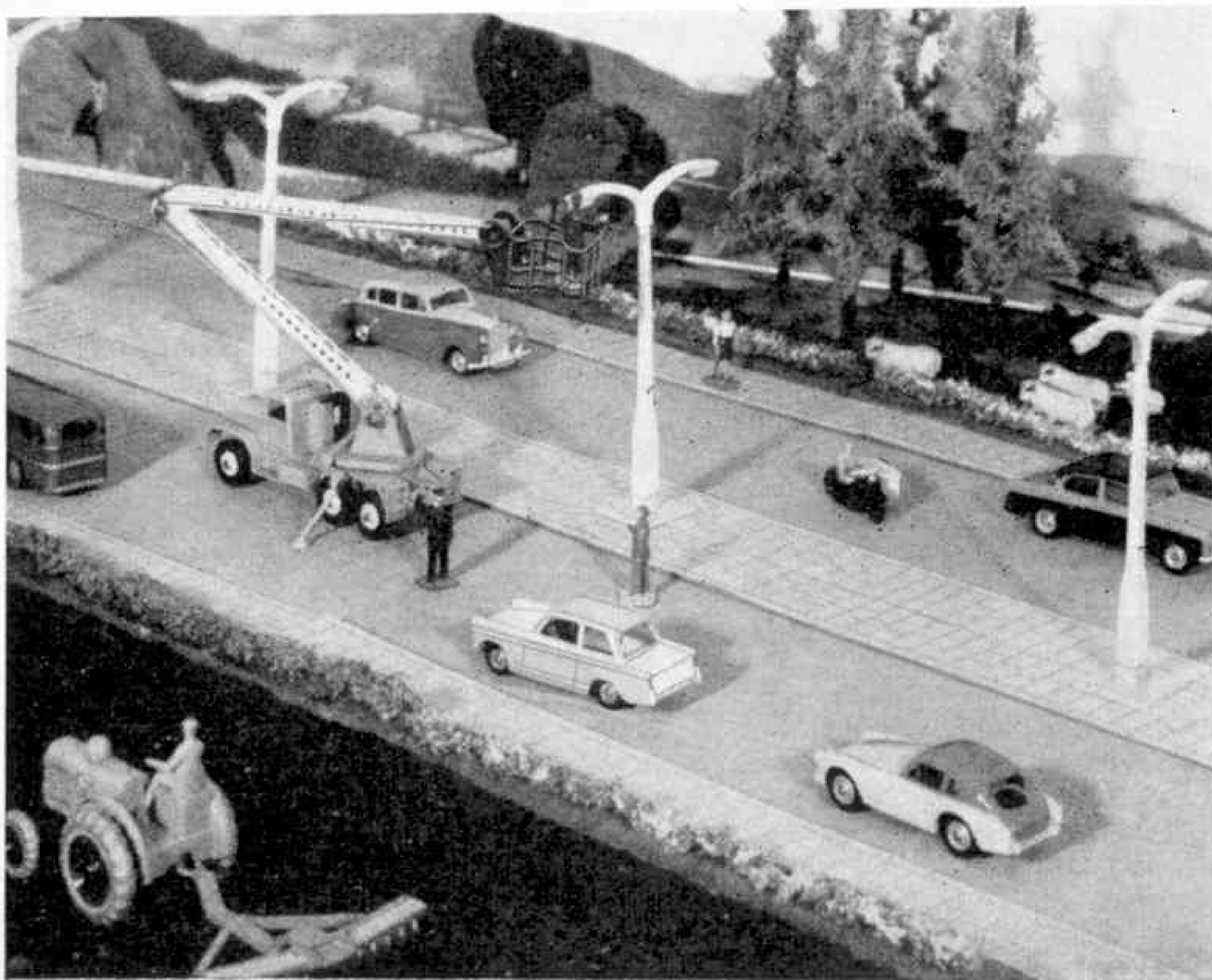
The styling is bang up-to-date,
The tail fins are "just right!"
The whole makes the immaculate
De Soto Firefly.

in this model the twin booms are mounted on a platform which can be rotated. The booms themselves are movable and are linked with a basket which can carry miniature personnel and which always stays level no matter how the booms may be raised or lowered. In everyday life these vehicles are used for erecting decorations for public celebrations, for the inspection of bridges and for the maintenance of buildings and street lighting, etc.

I had this last-named service in mind when I arranged the photograph which you see at the foot of this page. In this picture you will notice how use has been made of a series of Double Arm Lamp Standards (No. 756) mounted across Pavement Sections which form a long island on a busy main road.

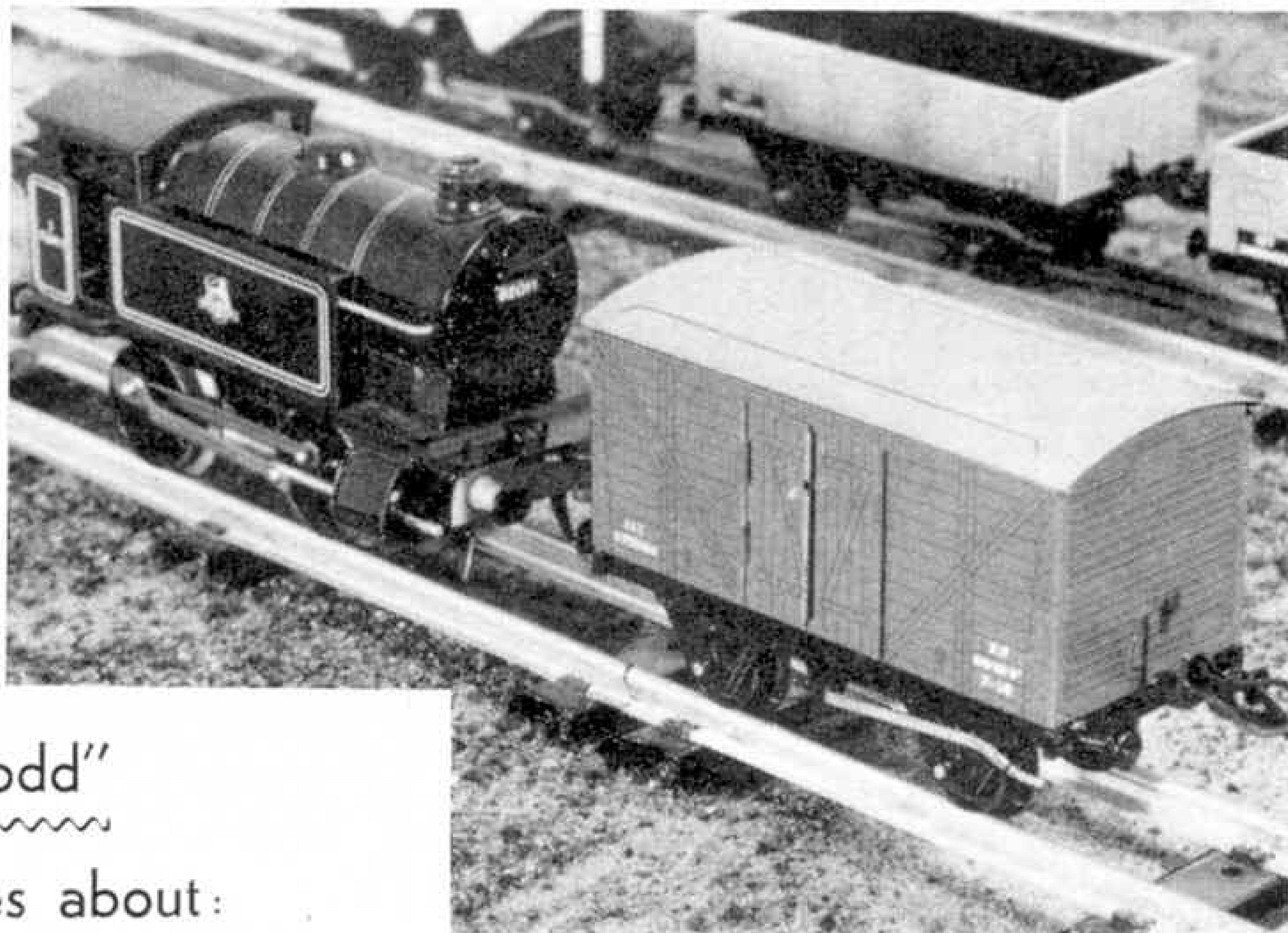
Clean Licence Contest

I have no doubt many of you are anxiously awaiting results of the Clean Licence Competition which has been run this year in conjunction with the Dinky Toys Collector's Licence. At the time of writing judging is still in progress, but I hope to announce the names of the winners in next month's *Meccano Magazine*. Those successful in the competition will, in any event, be notified by post and their names will also appear in the *Dinky Toys Newsletter*.



Keeping the
lamps in order.
The Commercial
Servicing
Vehicle perform-
ing an important
task on a busy
main road.

The No. 40 Tank shunts a Hornby No. 50 Goods Van, which is a fine representation of the B.R. Standard 12-ton ventilated van.



"Tommy Dodd"

writes about:

No. 50 Goods Vans

SOMEHOW Hornby No. 50 goods vehicles keep cropping up in these talks. This is not surprising, because they represent wagons, vans and other types that are extremely common in actual practice and Gauge 0 railway owners make very good use of Hornby No. 50 stock because they are sound and robust vehicles, of good appearance and with numerous attractive features.

Opening doors an attraction

There is one thing about the Hornby No. 50 Vans that I know appeals very strongly to many users and that is the inclusion of the correct type of opening doors. Similar doors are fitted on the corresponding Refrigerator Vans. I was reminded of this feature by the recent arrival at H.R.C. Headquarters of the photograph by P. J. Sharpe, of Huntley, Gloucestershire, which is reproduced at the top of the next page. This shows several vans as you often see them standing in goods yards, with the doors of one of them open after the discharge of a load. No doubt the van is waiting for fresh cargo.

This vehicle is not a B.R. Standard van, but it is very closely related to the design represented by the Hornby No. 50 Van, which you see being shunted by the No. 40

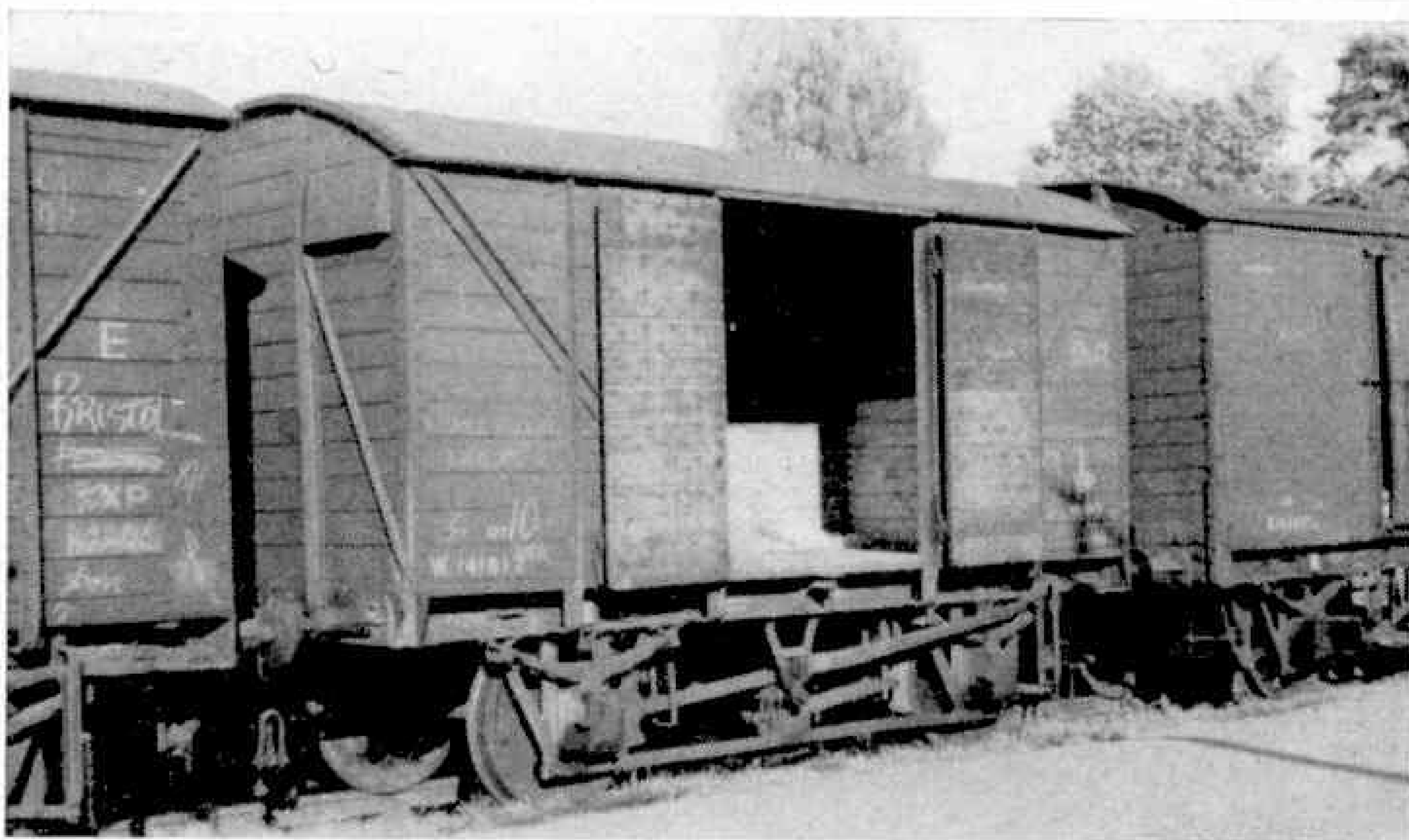
Tank in the picture at the top of this article. The tinprinted bodywork of the No. 50 Van incorporates the details of the pressed steel ends characteristic of B.R. Standard vans, whereas the one shown in our reader's picture follows earlier G.W. practice. Although there are many B.R. Standard vehicles about, certain older types are still in use and it is interesting to compare the differences in details such as these. I expect many of you already enjoy this particular activity.

Those chalk marks

One thing about railway goods vehicles in general I find of great interest is the use of the numerous and varied chalk markings that appear on them. Often these refer to the destination of the traffic loaded, say, in a van, and where several markings are visible—as can happen—dates are sometimes included, and one can work out where the vehicle has been to recently. Other markings, and sometimes numbers, appear elsewhere, probably in connection with the shunting or marshalling arrangements at various yards. This chalking business is not peculiar to our railways but appears to be common practice more or less all over the railway world.

You cannot very well chalk on a Hornby

Typical covered vans in a siding. Notice the differences in construction, and particularly the various destinations chalked on the sides. Photograph by P. J. Sharpe.



Wagon or Van, but you can manage to write on them if you use what is known as poster paint. This is water colour, readily obtainable and easily used. One of its advantages is that if your first try at marking one of your wagons is not successful you can wipe it off and have another go. Don't forget that markings often appear inside the doors of vans, usually indicating what is to be stowed at one side or the other of the doorway. *Heathfield Line Fish*, which I once saw, is an example.

Where vans are allocated to a special traffic and are perhaps, intended to be kept on one particular run, it is usual for them to be marked with an instruction, such as *Empty to Edge Hill Liverpool L.M.R.* You can do this sort of writing with poster paint

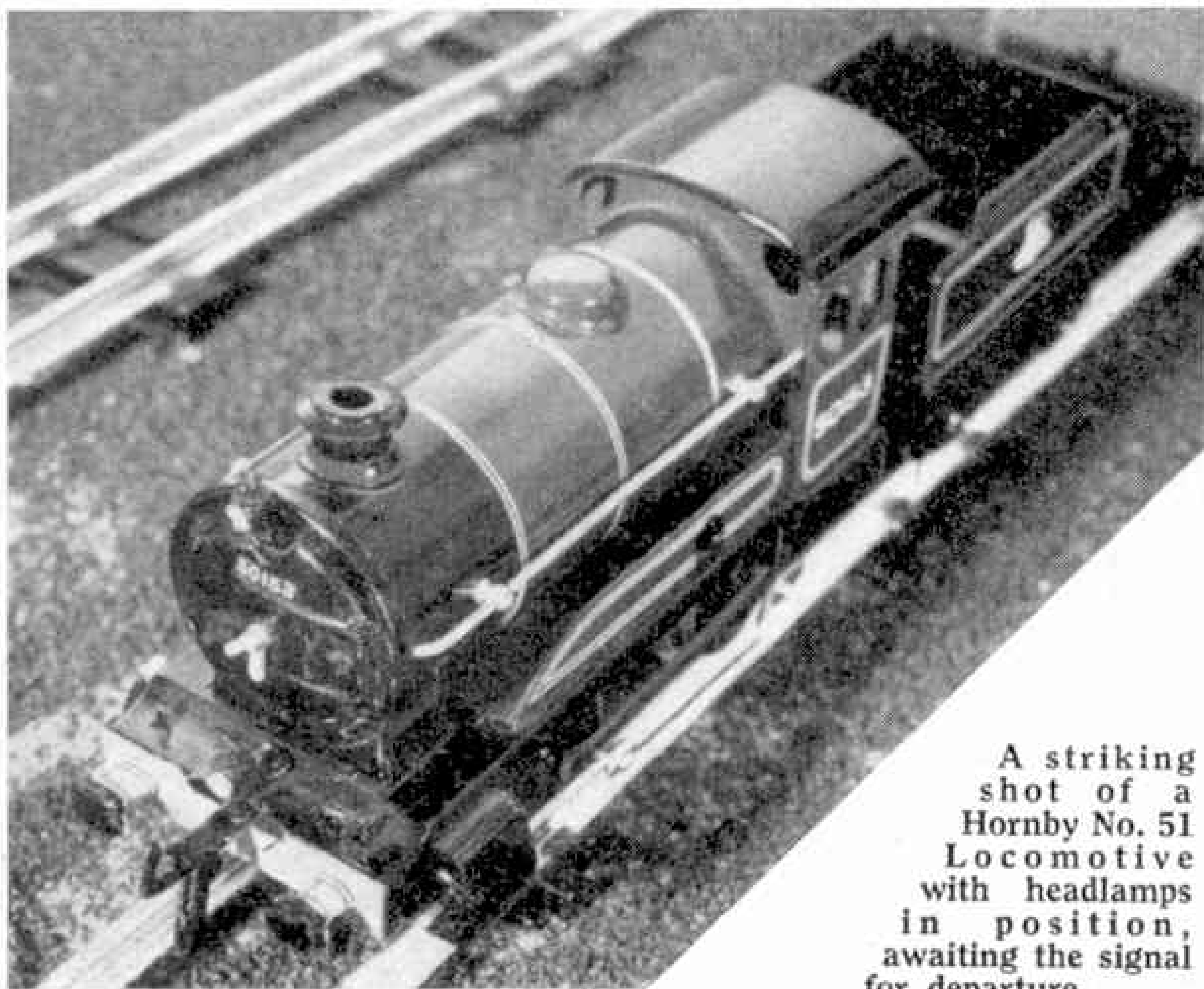
and, if necessary, you can make up your own names to suit your own layout and its traffic.

What class of train?

So far, we have not done much towards moving our trains this month, so no doubt the photograph below will be of interest. This shows a Hornby No. 51 Locomotive heading a through goods train. The scene could, in fact, be regarded as the sequel to that shown last month, where the same engine had just backed on to its train. Then the tail lamp was still in position, but now we have the headlamps set for a through main line run. The indication shown in our picture below, with one headlamp in the centre of the buffer beam and the other at

the top of the smoke-box door, is that displayed by a through freight or ballast train. The various distinctions between different kinds of freight trains, some according to the number of vehicles in their composition fitted with the vacuum brake, are indicated by the headlamps carried on the engines.

New readers of these pages may wonder how to distinguish between those Hornby vehicles that are supposed to be fitted with vacuum brakes and those with hand brakes only. Older readers know this is quite easy. B.R. vehicles that are vacuum fitted are coloured bauxite brown and the others, for the most part, are grey.

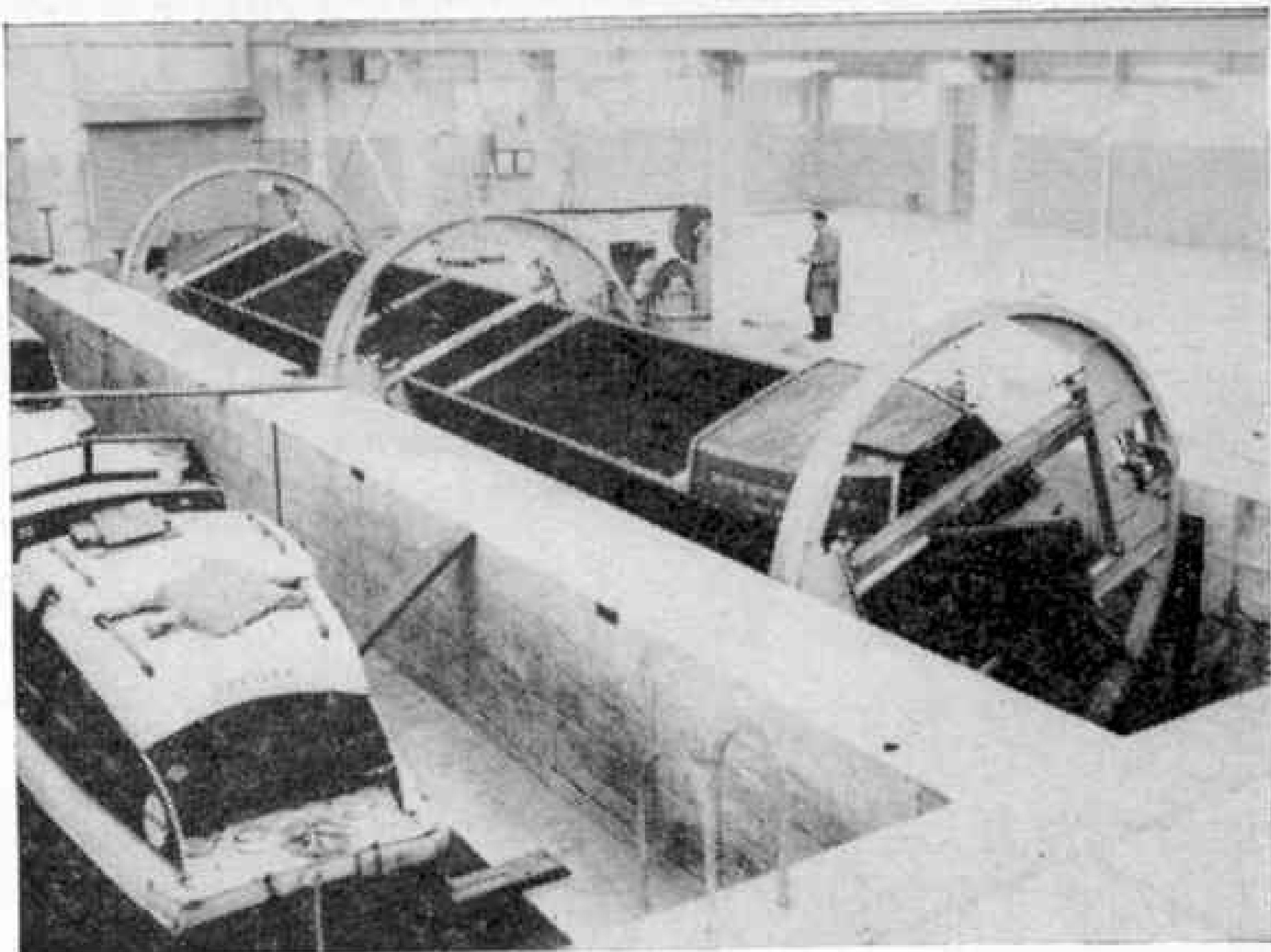


A striking shot of a Hornby No. 51 Locomotive with headlamps in position, awaiting the signal for departure.

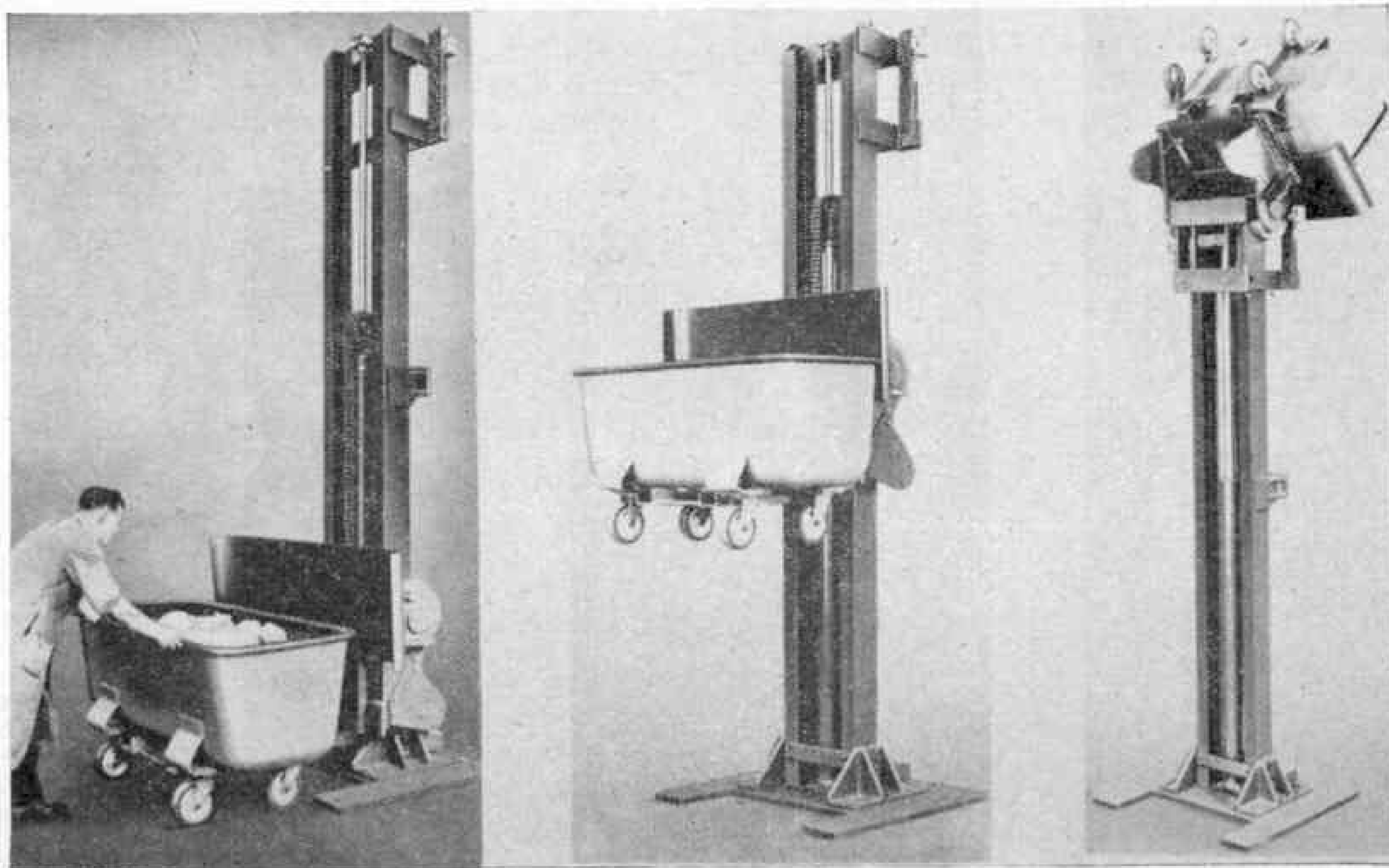
Of General Interest

AN unusual mechanical handling installation has recently been completed by Donald Ross and Partners, Ltd., of Crawley, Sussex, for British Inland Waterways. The equipment, shown in the picture on the right, is designed to position barges for inspection and maintenance purposes in a new dry dock inside a workshop built by British Waterways at Bilston (Staffs.).

Barges can be manoeuvred and floated from a basin through a lock gate at the workshop door where they are clamped into the manipulating equipment. This is permanently fitted in the dry dock and consists of three large steel ring assemblies supported on steel roller beds grouted to the dock floor. Rubber-tyred rollers in the dockside walls also support the rings. The three steel rings are interconnected by a long steel fabricated beam and, when the barge is floated into the "positioner" and the dock drained, the barge settles on this beam. Screw operated clamps are then used to secure the barge in the rings. The barge is then mechanically rotated into any required position for the removal of worn plates and for their replacement either by welding or riveting.



Conveyancer Fork Trucks Ltd., of Warrington, have produced the interesting new hopper loading unit seen in operation at the foot of this page. Units so far designed are for use in biscuit and bread production, but there are other applications in industry for this machine, for instance, as lift facilities in a large warehouse. Each unit consists of an elevating and tilting assembly operated by an electro-hydraulic power unit. A hydraulic valve in the channel base is worked by a push rod and pivoted levers. The operating sequence is illustrated in the pictures. A loaded container is wheeled on to the load forks of the carriage and then carried up vertical, braced steel channels until it tilts over and ejects its contents.





Railway Notes

By R. A. H. Weight

Aboard the Cornish Riviera Express

THE long-established *Cornish Riviera Express*, deservedly one of the prides of the "Western", covers the 305 miles between London and Penzance in about six and a half hours. It provides the quickest service of the day from Paddington to Plymouth, thence to principal stations in Cornwall, and affords a similar service in the opposite direction on a slightly longer overall timing. Many of the staff continue to know the westbound train as the "10.30 Limited", for there is still a somewhat exclusive air about it and there are certain ticket restrictions, as with other flyers, although there are no longer "slip carriage" or through branch portions detached on the way, as once there were.

On a recent trip by this train I recalled my first long journey by the "Limited" nearly 40 years ago when the locomotive, most powerful Swindon type of the period, was one of the Star 4-6-0s illustrated this month. I recollected, too, a more recent trip as far as Plymouth behind one of the larger King type, so long a mainstay of the West of England express services. Steam engines

were invariably changed at Plymouth on ordinary weekday working.

What a contrast, however, was presented this time by our almost new B-B Warship class diesel-hydraulic locomotive, No. D821, *Greyhound*, running right through to Penzance. Driver Church of Old Oak Depot, London, and his mate were, of course, relieved at Plymouth. We had "10 on"—about 375 tons gross.

Steady high-speed running

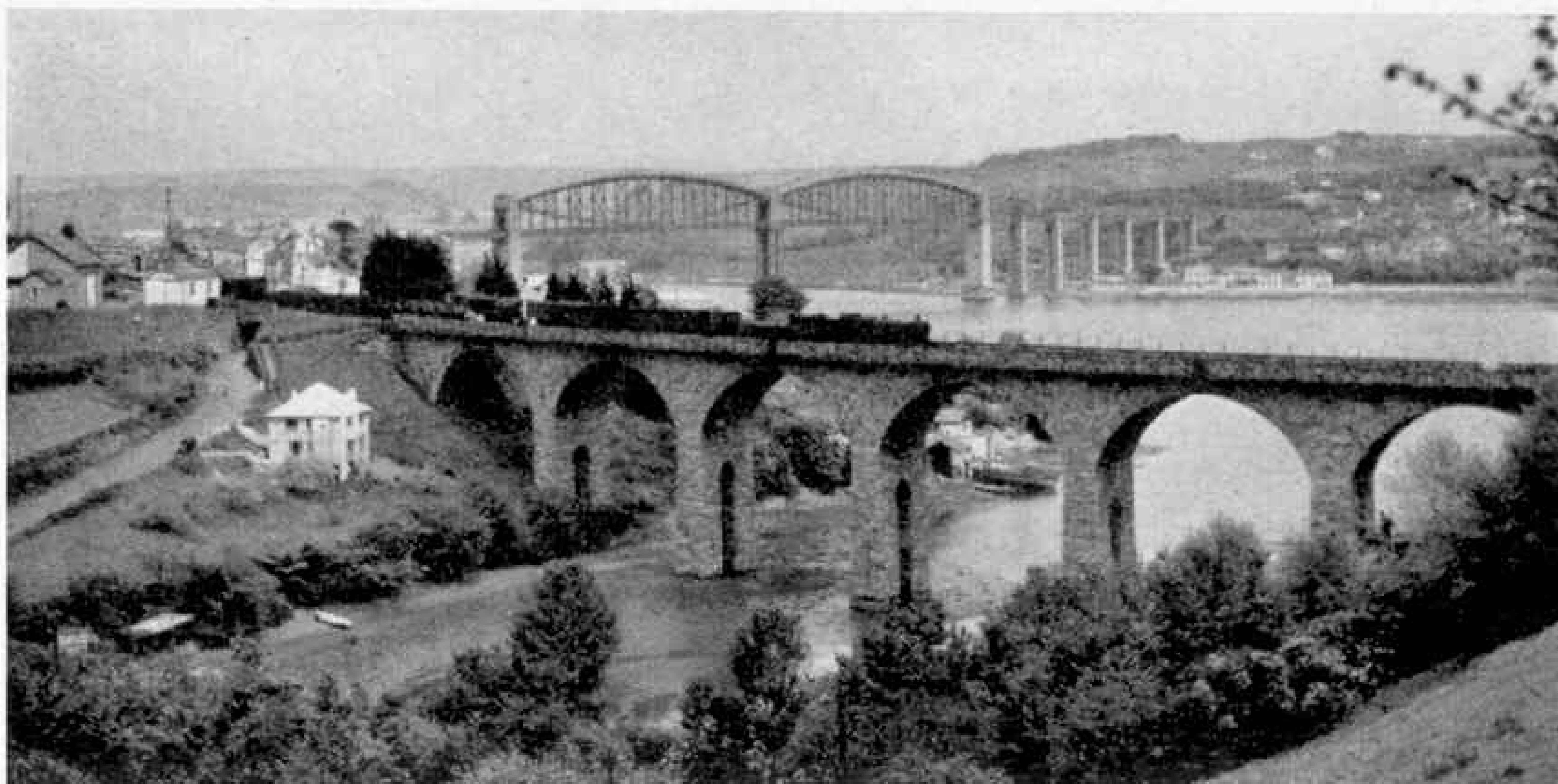
We had to wait for the green colour light signal aspect, so the start from Paddington was 3 min. late, at 10.33. There were two slowings for track or bridge repair work in the first fourteen miles, but every signal appeared to be clear throughout and, with an almost complete absence of further delay or out-of-course restrictions, all lost time was recovered in the course of a splendid, steadily fast, non-stop run to Plymouth, 225½ miles, without exceeding a maximum speed of 80 m.p.h. although we were often near that figure. Out in the open between Reading and Exeter 70 m.p.h. was averaged for well over 120 miles.

With time in hand for the more arduous stretches with their steep gradients and sharp curves, Whiteball summit, beyond Wellington (Som.) was breasted at 46 m.p.h.

Taunton, 143 miles, was passed at 70 m.p.h. in 132 min., and Exeter at 1.14 p.m.—173½ miles in 2 hr. 41 min. West of Newton Abbot the short, but very stiff, climbs



W.R. diesel-hydraulic locomotive No. D808 "Centaur" on the "Torbay Express", at Paignton. Photograph by A. W. Besley.



The Royal Albert Bridge at Saltash is seen in the middle distance of this fine photograph, taken from the Cornish side, by R. E. Vincent. In the foreground a Grange 4-6-0 is crossing Coombe Viaduct with a freight train.

each side of Totnes were surmounted at minima of about 21 and 25-30 m.p.h. respectively.

After an easy approach we pulled up at one of the fine new platforms in Plymouth (formerly North Road) Station at 2.25, actually 5 min. early, in 8 min. under the 4 hr. allowance from Paddington, as we had started late. Initial running delays included, this was equivalent to an unchecked average of nearly 60 m.p.h. all the way, with the maintenance of normal speed limits, a similar performance to that put up on occasion by steam King class locomotives with like loads, although sometimes with higher maximum speeds.

Cornish scenery

When one leaves the busy city activities of Plymouth, and looks down upon the Dockyard and work-day maritime scenes of Devonport, a spectacular vista soon opens out as the train, high above land and water, sweeps round great curves and crosses the 100-year old Royal Albert Bridge, with its single line of rails, and enters Cornwall at Saltash, going over the wide Hamoaze and Tamar estuary which provides such wonderfully assorted views in various directions. On a sunny, clear day the river, sea, moorland and woodland scenery, particularly in Devon and Cornwall, added considerably to the delights of the journey. The hilly, winding course of the main line in Cornwall does not permit much high speed, but time was well in hand as far as I travelled. There are intermediate stops at Par, Truro, Gwinear Road and St. Erth,

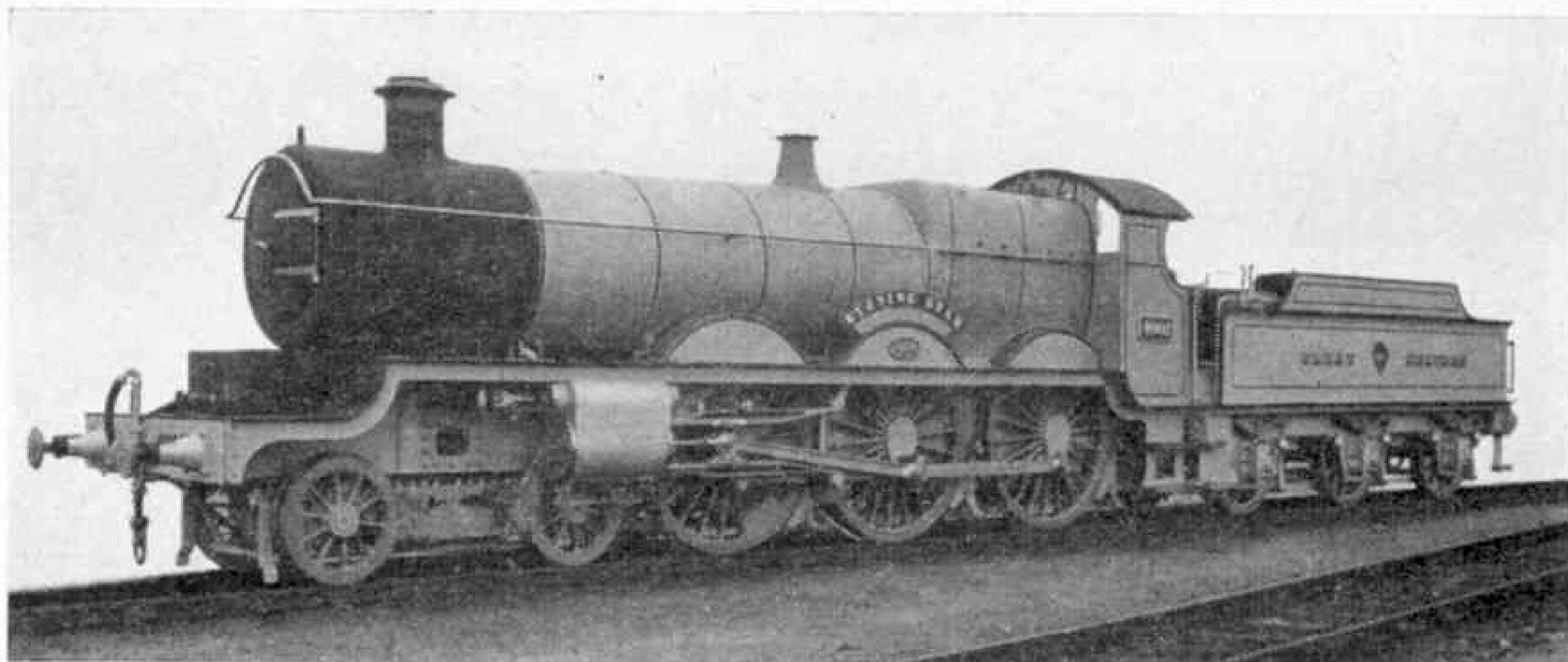
and local and branch train or road connections are available to and from many of the principal or more remote coastal resorts.

A look round in the West

I saw a number of the Warship class diesels on main line work on each side of Plymouth; two of the smaller 1,100-h.p. type, also with hydraulic transmission, Nos. D6310, and D6314 together, were travelling towards Penzance with a semi-fast. Steam County class 4-6-0s were seen on *The Royal Duchy*, also other passenger or milk trains, as well as several mixed-traffic Granges in Cornwall, behind one of which I travelled up a steep climb between Lostwithiel and Liskeard. On the lovely, single-line branches from the two last-named stations, to Fowey and Looe respectively, the engines were 5500 class 2-6-2Ts, and other small tanks were also seen.

The Looe branch leaves Liskeard from a separate platform at right angles to the main line, reverses with engine running round at the first halt, and traverses a great curve before passing underneath the Plymouth-Penzance tracks. Then, continuing in the opposite direction, so to speak, it accompanies the river, in similar manner to the Fowey branch, with its wider waterway, to the quaint and hilly-harbour-seaside little towns. At Fowey, British and foreign vessels load china clay for export or coastal sea conveyance, at railway-owned quays, amid beautiful scenery. From my hotel room—and even while enjoying early morning tea in bed—I was able to view this activity and see the trains coming and going.

My first experience of steam plus diesel haulage was behind No. 4975, *Umberslade*



G.W.R. No. 4002 "Evening Star" of the class of Swindon 4-6-0 from which the Castle and King designs of four-cylinder engines were evolved. Compare this with "Evening Star" of 1960, illustrated on page 288 in the "M.M." in June. British Railways Western Region official photograph.

Hall and D806, *Cambrian*, on a through train to Manchester from Penzance. This was made up to 10 coaches at Plymouth and was double-headed over the severe section from that point to Newton Abbot, although apparently within the usual unaided limit for a 2,200 h.p. diesel unit, which is similar to that for a King. Two engines are still needed for the heavier trains, but not to the same extent as formerly.

Variety at Exeter

Exeter St. David's (W.R.) main line station, is used by S.R. through trains or portions running between London, Waterloo, or Brighton, etc., and North Devon or North Cornwall. At that point they are running in the opposite direction to the W.R. expresses and main line services. I watched part of the *Atlantic Coast Express* bound for Waterloo (although at that moment it was facing west) leave behind No. 34065, *Hurricane*, Battle of Britain class 4-6-2 which tackled, without assistance, the tough climb to Central (S.R.) Station with six of the heaviest coaches.

Instead of elderly ex-Brighton tanks, S.R. modern 3-cylinder class Z 0-8-0T engines now perform banking duties there. Exeter is an extremely busy traffic centre on summer Saturdays and other holiday times. It is curious that the fastest trains to London—the *Torbay Express*, from St. David's and the *Atlantic Coast Express* from Central—depart within ten minutes of each other.

The "Torbay" made up time

The best train of the day from Kingswear connecting by ferry from Dartmouth—the

up *Torbay Express*—begins its run along another charming riverside single track, and loads at the popular resorts of Paignton and Torquay. It joins the main line at Newton Abbot without stopping and calls finally at Exeter, where I boarded this 10-coach express, similar to the "Limited", headed by No. D820, *Grenville*. The start, up gradually rising grades, was lively, but we were stopped just where speed could have been increasing rapidly after Whiteball summit, at Wellington, for $1\frac{1}{2}$ min., 150 miles from London. All was clear from then on apart from signal checks in the London suburbs, although there were several repair or maintenance slacks. Passing Taunton full tilt at 1.16 p.m. and attaining 82 m.p.h. at several points, easing down at others, we averaged 65 m.p.h. over the next 124 miles to Slough.

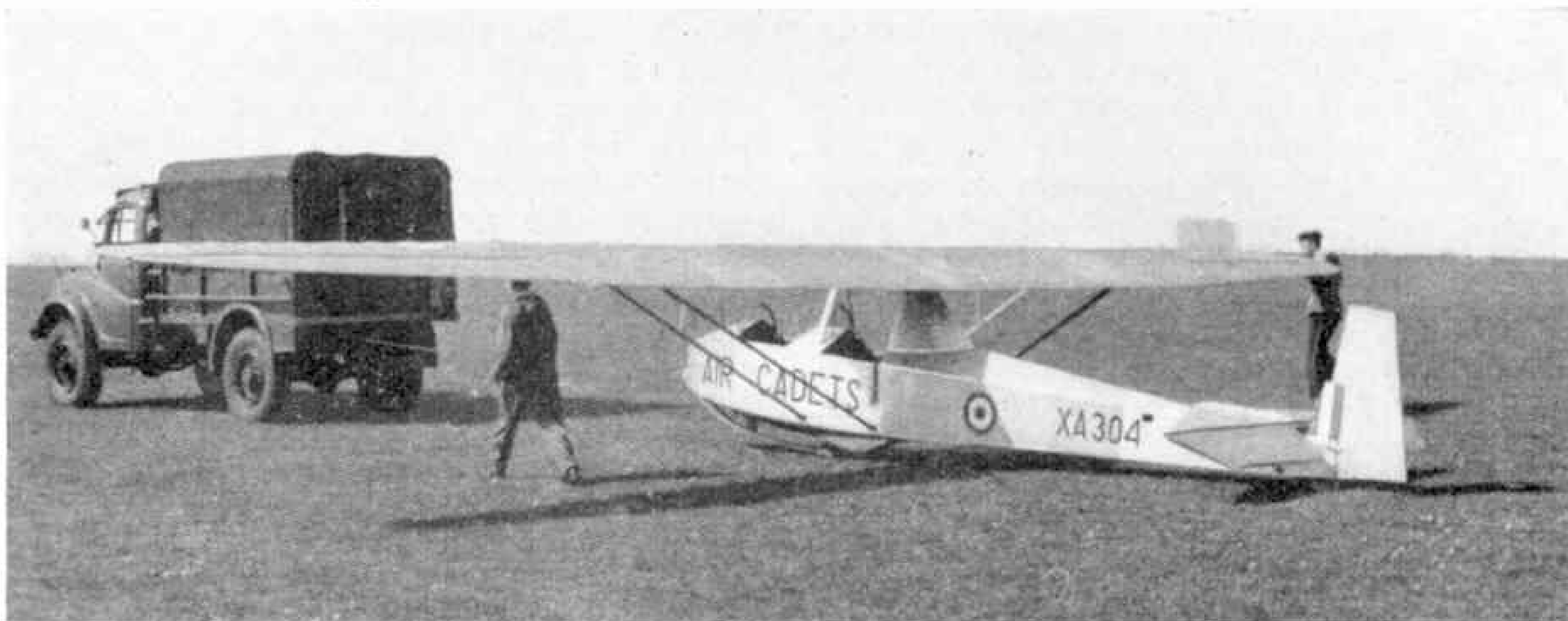
As is often the order of the day on such expresses, there were two busy and well-organised services of a good four-course lunch. When we reached the outer end of No. 8 platform at Paddington, we had averaged a mile a minute from the Exeter start, in spite of delays, coming to a final stand just ahead of time at 3.34½ p.m.—173½ miles in 174½ min.—a first-rate run!

New Luxury Trains in Australia

Mr. A. Kay informs me that the Commonwealth Engineering Company of Granville, Sydney, is to build splendidly-equipped, stainless steel rolling stock for new fast services between Sydney and Melbourne, 590 miles apart, when the re-routed line linking the interstate (New South Wales and Victorian Government systems) standard rail gauge is inaugurated at the end of 1961.

WEEK-END SCHOOL FOR AIR CADETS

Gliding in a World of their Own



A Cadet Mk. III glider being towed from the hangar for a day's flying at R.A.F., Hornchurch.

THE setting is the R.A.F. Station at Hornchurch, Essex. It is week-end, and at one end of the airfield Territorials of the Parachute Regiment are practising jumps from a balloon. At the other end of the airfield are six gliders belonging to 614 Gliding School, A.T.C. A truck, which has been travelling to and from the gliders all

By Ryan Jefferson

day, is returning with cables that will soon be used to launch gliders into the air.

An A.T.C. cadet, in the cockpit of one of the aircraft, is being briefed for what is to be the first of three complete solo circuits of the airfield for his "A" and "B" Gliding Certificates and badges. His instructor suggests the most suitable landing approach and finally makes certain that his pupil knows just what to do in an emergency.

The cadet is now in sole charge of the glider. He orders everyone clear of the aircraft, the only exception being the Wing Tip Orderly who remains to keep the machine horizontal.

Signal for take-off

The cadet satisfies himself that all is clear in front for take-off, then gives the order to be hooked on to the cable. The orderly makes one final check that the field is clear for take-off, then reports, "All clear above, behind and on the approach."

"Take up slack!", orders the cadet.

One of the ground crew starts to flash a signal lamp. At the other end of the field, the winch driver sees the Aldis lamp and starts winding in the cable. As soon as the slack has been taken out of the cable the cadet orders the "All out" signal.

The Aldis changes from slow to quick flashes, and the driver brings his winch up to full power. The glider moves forward, quickly gathering speed. Now the cadet can feel the glider beginning to lift, and he concentrates on keeping the aircraft straight and level until he is about 100 feet above the ground.

The winch driver, having noted that the glider is well and truly airborne, slowly eases down on the winch throttle. The cadet pulls back on the control column and puts the aircraft into a steep climb. He checks any drift, and maintains a course towards the winch. When he is about 700 feet up and almost directly over the winch, he releases the cable.

Landing approach

He starts his turn and the glide back to the other end of the airfield. Glancing at his instruments, he checks the rate of descent and the speed through the air. Below, he can see the small group of instructors and cadets, and the truck that will come out to him after he has landed. He concentrates on being in the right position for the landing approach, and sinks to 300 feet—the critical height at which he is committed to land—then swings the aircraft crosswind, coming

down to 150 feet. With a final turn into the wind, the cadet straightens and levels up the glider for landing. Now, he is down to 100 feet.

The truck starts up, and moves out to meet the glider as it slithers along the airfield and comes to rest. Glider and cadet are then towed back to the point of departure and a critical appraisal of the flight from the instructor. After two more solo circuits, the cadet will be the proud possessor of the "A" and "B" Certificates, and the gliding school will be credited with one more successful pupil.

No. 614 Gliding School is one of 27 A.T.C. training centres based all over the country. Operating week-end and occasional full-time courses, the school reckons to train about 100 cadets every year. The pupils are selected from local A.T.C. squadrons and from R.A.F. sections of schools' C.C.F. To qualify as a pupil of a gliding school, a cadet must be at least 16 years old and should have attained a proficiency badge or some seniority within his particular unit. He must also be medically fit and have his parents' permission to fly. The gliding school takes on a new course of ten cadets approximately every five weeks. All cadets are expected to reach solo standard by the end of the course.

Background knowledge

Few of the pupils have had any previous gliding experience, but most of them have a good background knowledge of flying. On the first day of the course, the cadets attend a lecture on the elementary theory of gliding and on airfield

discipline. But apart from the briefing before each day's flying, all actual instruction takes place in the cockpit of the glider.

The cadet is allowed to handle the controls at a very early stage in his training—usually after the second or third launch. He learns how to use the control column (or stick) and the rudder pedals. The stick is used to operate the ailerons and elevators. By moving it to left or right, the ailerons which run along the back of each wing are raised or lowered. They work in opposite ways to one another, so that with one aileron raised and the other lowered, the air flow will cause one wing to lift and the other to drop, thus putting the glider into a roll which is usually part of the turning manoeuvre. The elevators, on the tail, are controlled by pushing or pulling back on the stick. They pitch the nose of the glider up or down; thus, when the stick is eased

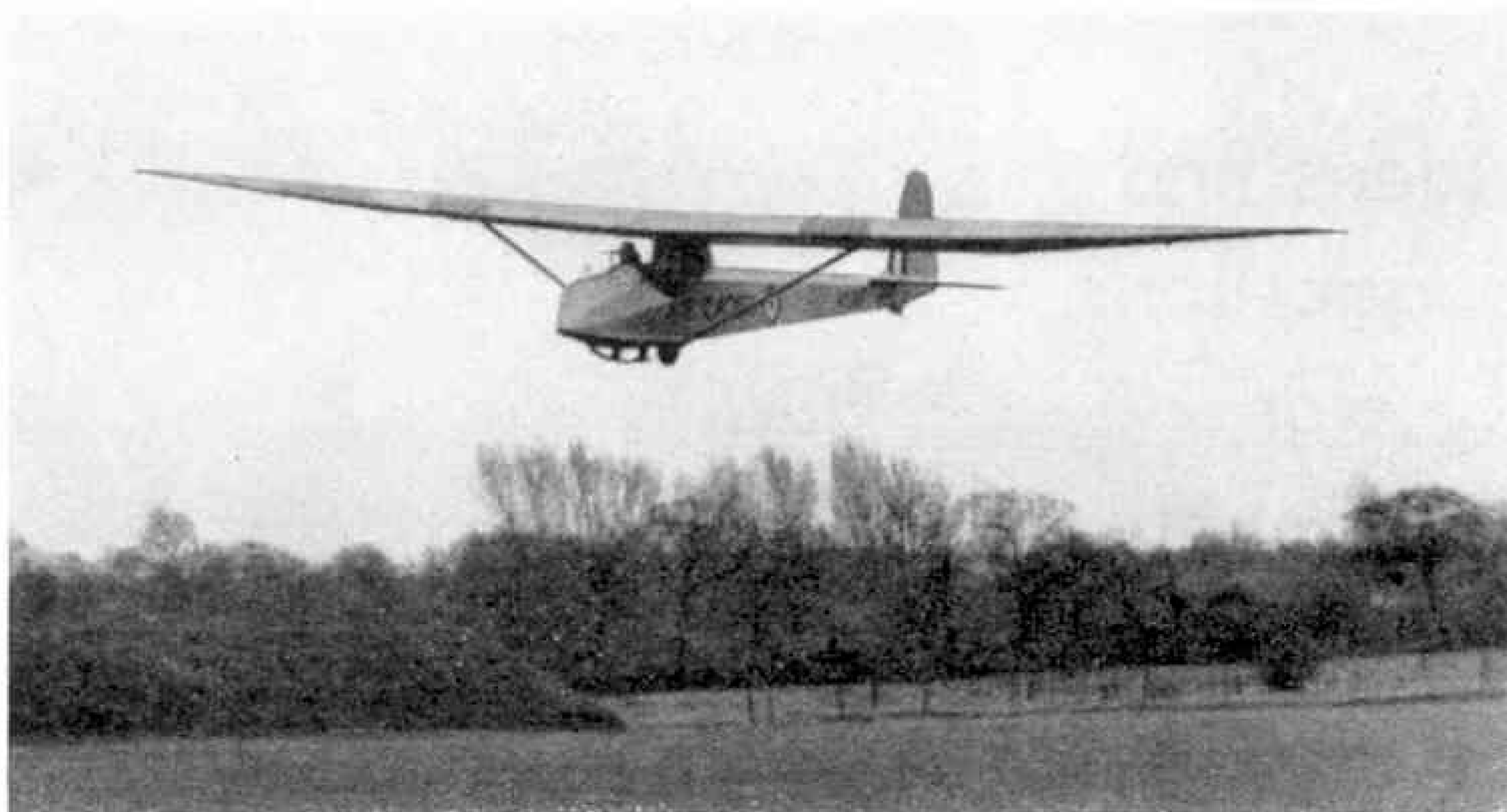


Above: A member of the ground crew attaches the end of 3,000 feet of cable used for launching the glider to heights of up to 1,000 feet.

Below: The cadet, seated in the cockpit of a training glider, is about to be launched on the first of three solo flights for his "A" and "B" Gliding Certificates.



A Sedbergh glider coming in to land. The pilot has turned into the wind and is levelling off for a smooth landing.



forward, the tail elevators drop and the air-flow brings the tail up and the nose down.

The rudder is the least important of the controls. The cadet is taught to use the rudder more as a balancing control during manœuvring than as a means of turning. A spoiler control lever is also fitted to some training gliders. This operates spoilers on top of the wing. These flaps, when raised, break the air flow and cause the glider to lose height more rapidly. Such a control is often very useful for the landing approach.

There are also a number of instruments in the cockpit—the air-speed indicator, which measures the speed of the glider through the air; the altimeter, which indicates the height of the glider above ground level and the variometer which consists of two gauges, one showing the rate of descent, the other the rate of climb.

Mastering the controls

Most cadets soon master the controls and learn the significance of their instruments, but they require plenty of flying time in order to practise the various manœuvres. During training, the instructor sits alongside the pupil (in the Sedbergh) or behind him (in the Cadet Mk. III Glider). Both pupil and instructor have identical controls and instruments. When the instructor is satisfied that his pupil can handle the aircraft in flight, the cadet is then taught the more complex procedures for take-off and landing.

With about 30 flights behind him, the pupil is usually up to solo standard. He is then sent up on one or two pre-test flights, during which he is expected to handle the glider for the full circuit. If he proves competent on these flights, he is permitted to carry out the further flights for the "A" and "B" Certificates. Having gained these, an

outstanding cadet is sometimes selected for further training for the "C" Certificate. To gain this, he must stay in the air for 15 minutes.

The various gliding certificates are awarded by the British Gliding Association to which the A.T.C. is affiliated, and the association is, in turn, linked with the *Federation Aeronautique Internationale*, the international gliding organisation.

Special equipment

Highest of the various awards for gliding is the Gold "C" Certificate. To gain this the glider pilot must reach a height of 10,000 feet, cover a distance of 180 miles, and stay in the air for more than five hours. He may also add a diamond to his Gold "C" for each of the following: a flight of at least 180 miles to a destination declared before take-off; a climb of over 16,500 feet; a distance flight of over 300 miles.

A pilot who has gained a Gold "C" Certificate will almost certainly be in the championship class. Special gliders and equipment are usually used to gain these premier awards, and also for long cross-country flights. Such equipment will include a compass, maps, radio, oxygen (for heights of 14,000–18,000 feet) and a Barograph, which records on a chart, the heights reached during a flight.

For many flying school pupils, the end of a five week-end course is the end of gliding. Many cadets find they do not have the opportunity, or the time, to continue, although there are some who join civil gliding clubs to perfect their gliding technique. But whether the cadet is thinking of gliding in terms of a few week-ends, or much longer, these A.T.C. courses provide an excellent introduction to a fascinating sport.

Ideas and Suggestions for Meccano Model- Builders

By
"Spanner"



The illustration on this page shows a moment of success in the life of young David McGowan, who lives in Nairobi, Kenya. David is a keen Meccano model-builder and in the illustration referred to he is shown demonstrating to an audience including Sir J. R. Farquharson (General Manager of the East African Railways and Harbours) and several young African children, a fine Block-setting Crane he built entirely by himself as an exhibit for the eighth annual Arts and Crafts Exhibition of the East African Railways and Harbours. Later David was presented with a special prize for his efforts by Lady Farquharson.

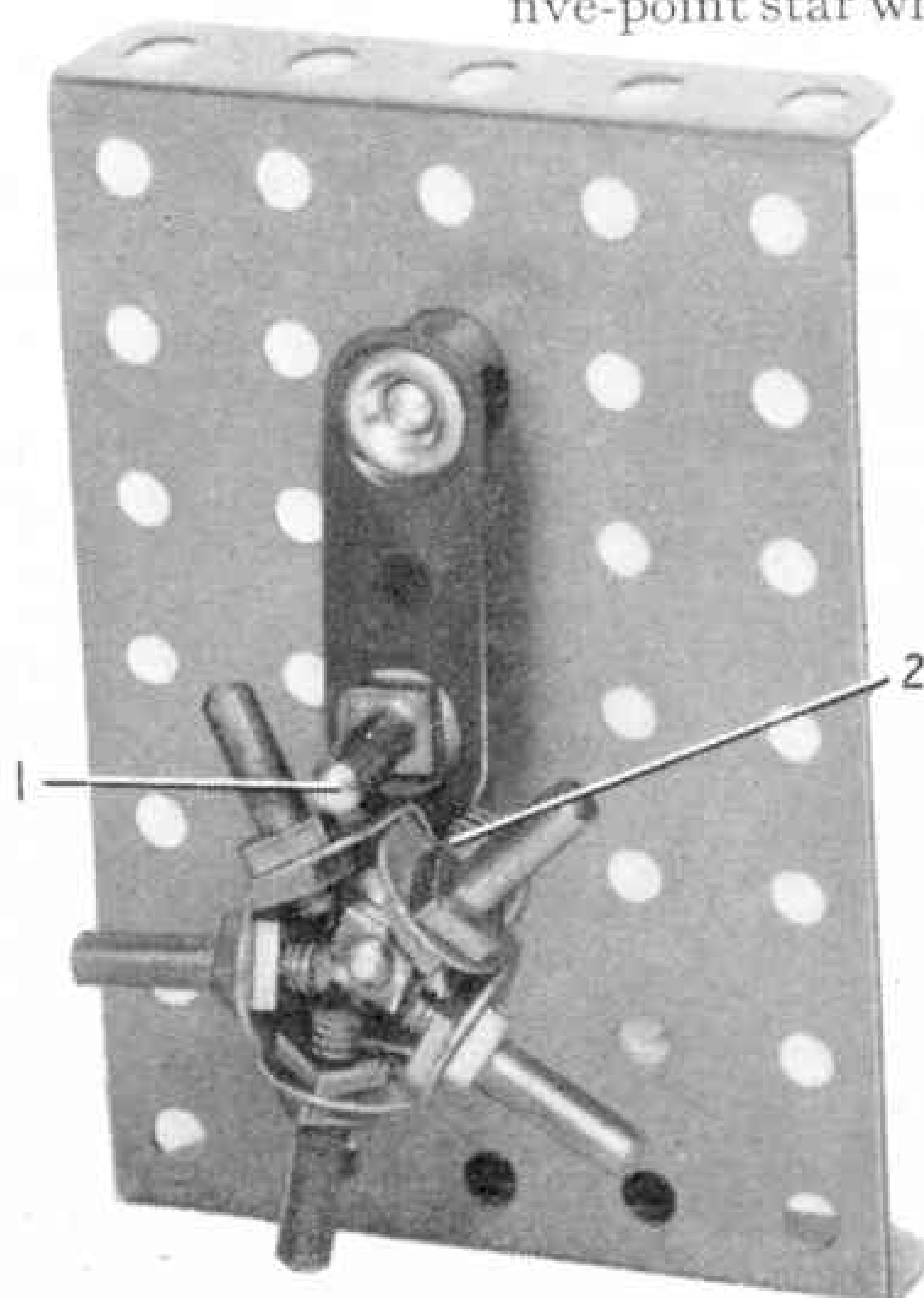
African children are taking an ever increasing interest in Meccano and many are really keen and capable model-builders themselves.

The photograph on which our illustration is based is reproduced by courtesy of the East African Railways and Harbours.

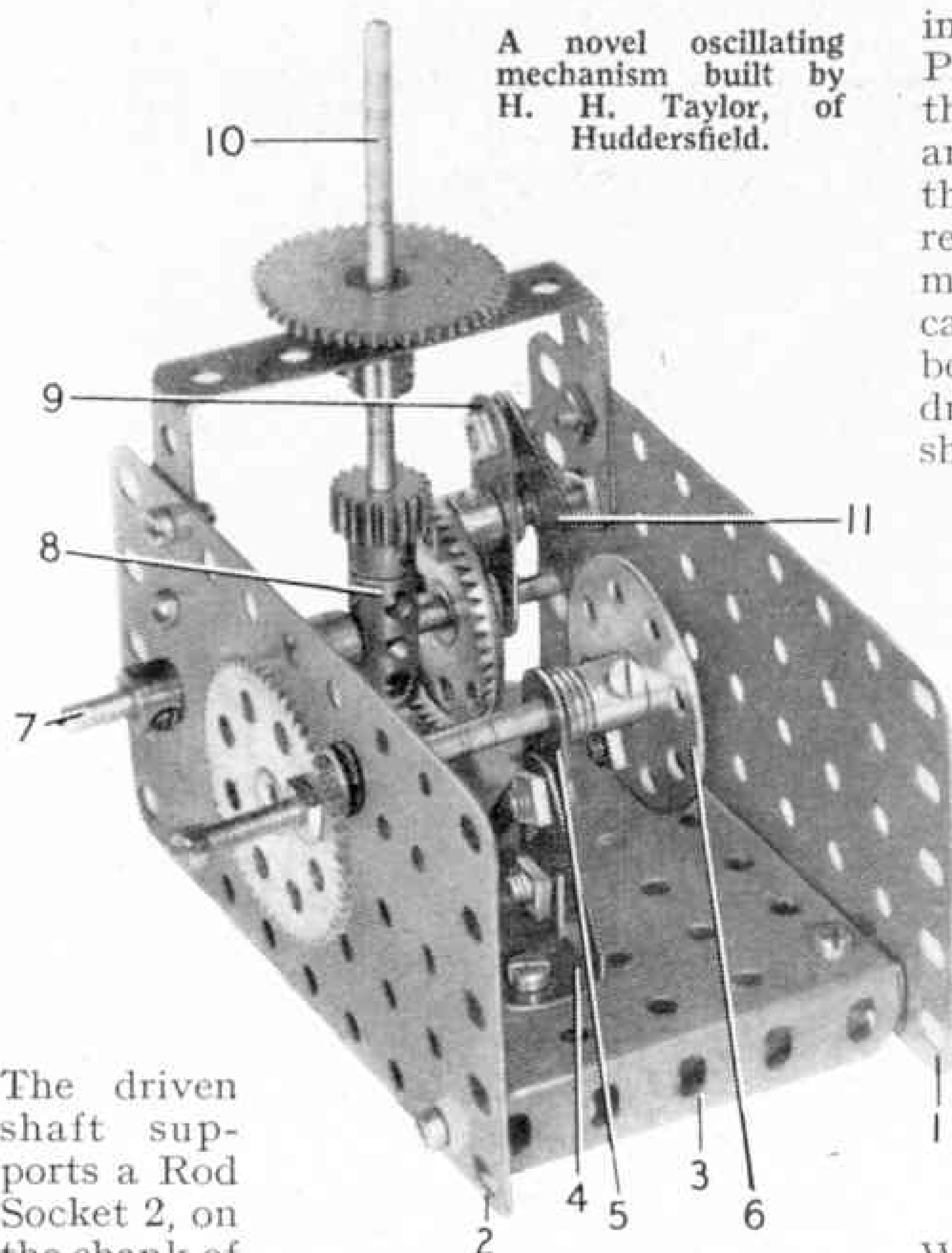
Sir J. R. Farquharson (General Manager of the East African Railways and Harbours) surrounded by keenly interested African children, watching a demonstration of a Block-setting Crane built by David McGowan, Nairobi, at an Arts and Crafts Exhibition.

An Intermittent Drive Arrangement

Fig. 1 illustrates an unusual form of intermittent drive that makes use of a five-point star wheel built up from Threaded Pins. By means of this arrangement a fifth of a revolution of the driven shaft can be obtained for each complete revolution of the driving shaft. When the device is used in conjunction with a 2:1 gear ratio it will provide a total ratio of 10:1 and it is therefore suitable for use in revolution counters and calculating machines. Details of the arrangement are as follows. The driving shaft carries a Crank fitted with a Threaded Pin 1.



An intermittent motion mechanism that can be used to give a 10:1 ratio between driving and driven shafts.



A novel oscillating mechanism built by H. H. Taylor, of Huddersfield.

The driven shaft supports a Rod Socket 2, on the shank of which five

Angle Brackets are fixed by a nut. A Threaded Pin is held by its nut in each Angle Bracket, to make a star wheel with five spokes.

As the driving shaft rotates the Threaded Pin 1 engages each of the spokes of the star wheel in turn and moves this wheel through one-fifth of a revolution. It is necessary to adjust the position of the Threaded Pin 1 in the slotted hole of the Crank until a smooth drive is obtained.

If the mechanism is required for use in a revolution counter or in a similar machine

in which a 10:1 ratio is necessary, a $\frac{3}{4}$ " Pinion should be fixed on the same Rod as the star wheel. This Pinion should be arranged to mesh with a 50-tooth Gear on the output shaft, and will provide a 2:1 reduction ratio. As a result of this arrangement the total ratio between the Rod carrying the Crank and the output shaft will be 10:1, and for each complete turn of the driving shaft and its Crank the output shaft will rotate one-tenth of a revolution.

A Novel Oscillating Mechanism

The mechanism shown in Fig. 2 provides a swishing oscillating movement for which ingenious readers may be able to find interesting uses. At any rate, it will perhaps stimulate experiment in devising models in which it can be put to practical use.

The details are as follows: Two $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plates 1 and 2 are attached to a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 3 by means of Angle Brackets. To a Trunnion 4, which is bolted to the Flanged Plate, a $1\frac{1}{2}"$ Strip 5 is attached. A 2" Rod is journaled in the Flat Plate 2 and the $1\frac{1}{2}"$ Strip, and a Bush Wheel 6 is secured to it.

A 4" Rod 7 has a $1\frac{1}{2}"$ Contrate Wheel fixed to it, and to the Contrate a $1\frac{1}{2}"$ Strip 9 spaced away by a Collar is bolted. Also on this Rod is a Coupling 8 and a Collar. A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Double Angle Strip is bolted to the Flat Plates to support a Rod 10, the lower end of which is free to revolve in the Coupling. A $\frac{1}{2}"$ Pinion, a Collar, and a 50-tooth Gear Wheel are secured to the Rod 10.

A $2\frac{1}{2}"$ Strip 11 is *lock-nutted* to the $1\frac{1}{2}"$ Strip 9, and also to the Bush Wheel 6.

When the Gear Wheel fitted with $\frac{3}{4}"$ Bolt is rotated an oscillating movement is imported to the output Rod 10.

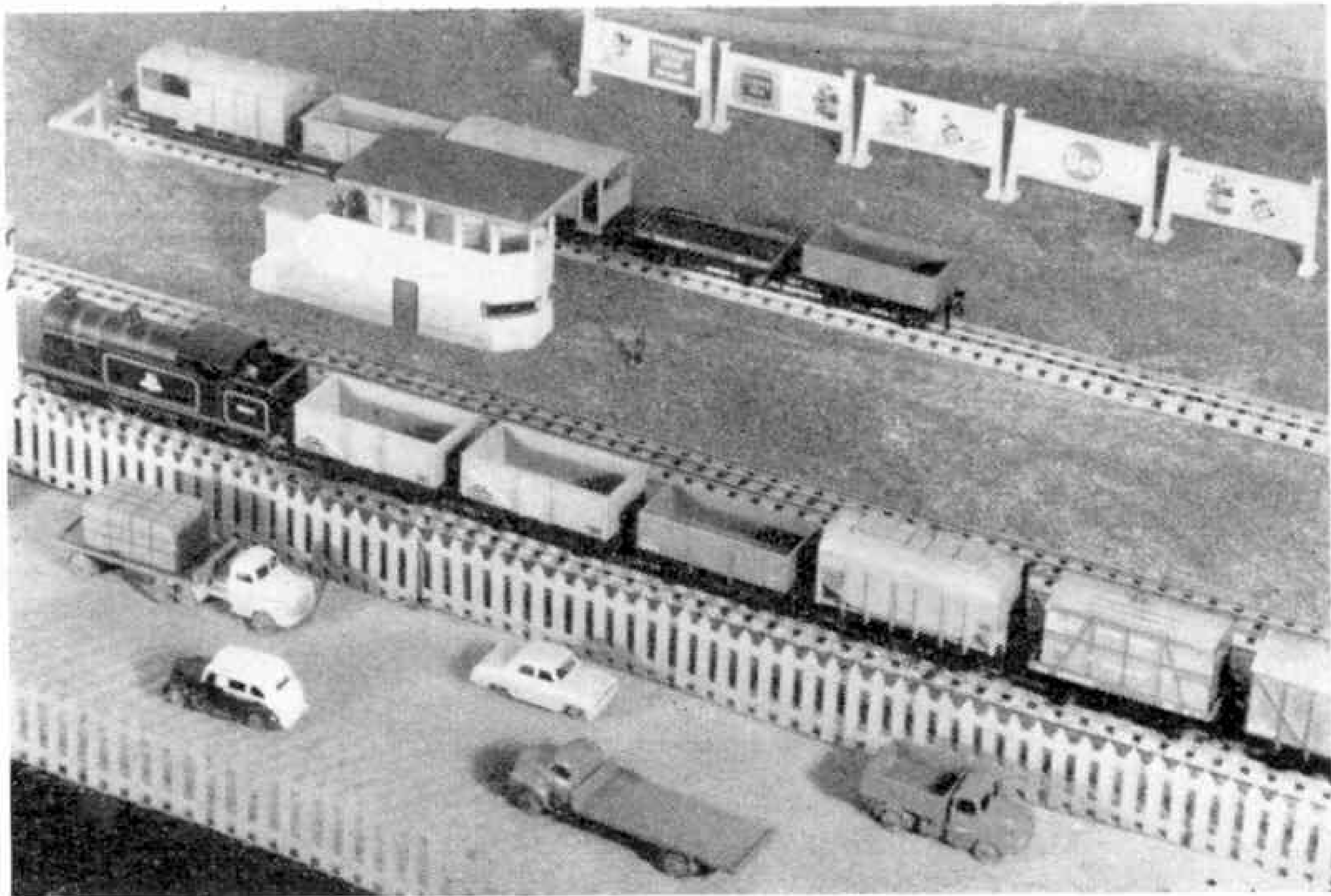
Big Prizes for Small Models

THE Simplicity Model-Building Competition announced in the June issue of the Magazine is still open for entries, and the closing date is August 31.

In this contest we are offering cash prizes for miniature Meccano models of any kind constructed realistically with the minimum number of parts. It is not necessary for a model actually to work; a realistic appearance is all that is required. It is possible to make hundreds of really life-like models using no more than a dozen or so Meccano parts, and the prizes will be awarded to

those who succeed in producing the most realistic and original models. It is only necessary to send a photograph or a good sketch of any model you wish to submit. Entries should be addressed: "Simplicity Model Building Competition, Meccano Ltd., Binns Road, Liverpool, 13".

The prizes will be as follows: First, Cheque for £5 0s. 0d.; Second, Cheque for £3 0s. 0d. Third, Cheque for £1 10s. 0d. There will be also ten prizes of 15/- and ten prizes of 7/6d.



Road and rail run parallel here and there is plenty of road traffic consisting of Dublo Dinky Toys.

HOLIDAY CHATTER

AS this is a holiday month, I think perhaps you would like our talk to be of a lighter character than usual. Although you may not be doing a great deal of train running just now you are sure to have one or two thoughts about various additions

the size of these little vehicles should not add to your packing problems when you are getting ready to return home. So if you are wondering what you can take back with you, as a reminder of a good time away, why not a Dublo Dinky Toy?

HORNBY RAILWAY COMPANY

By the Secretary

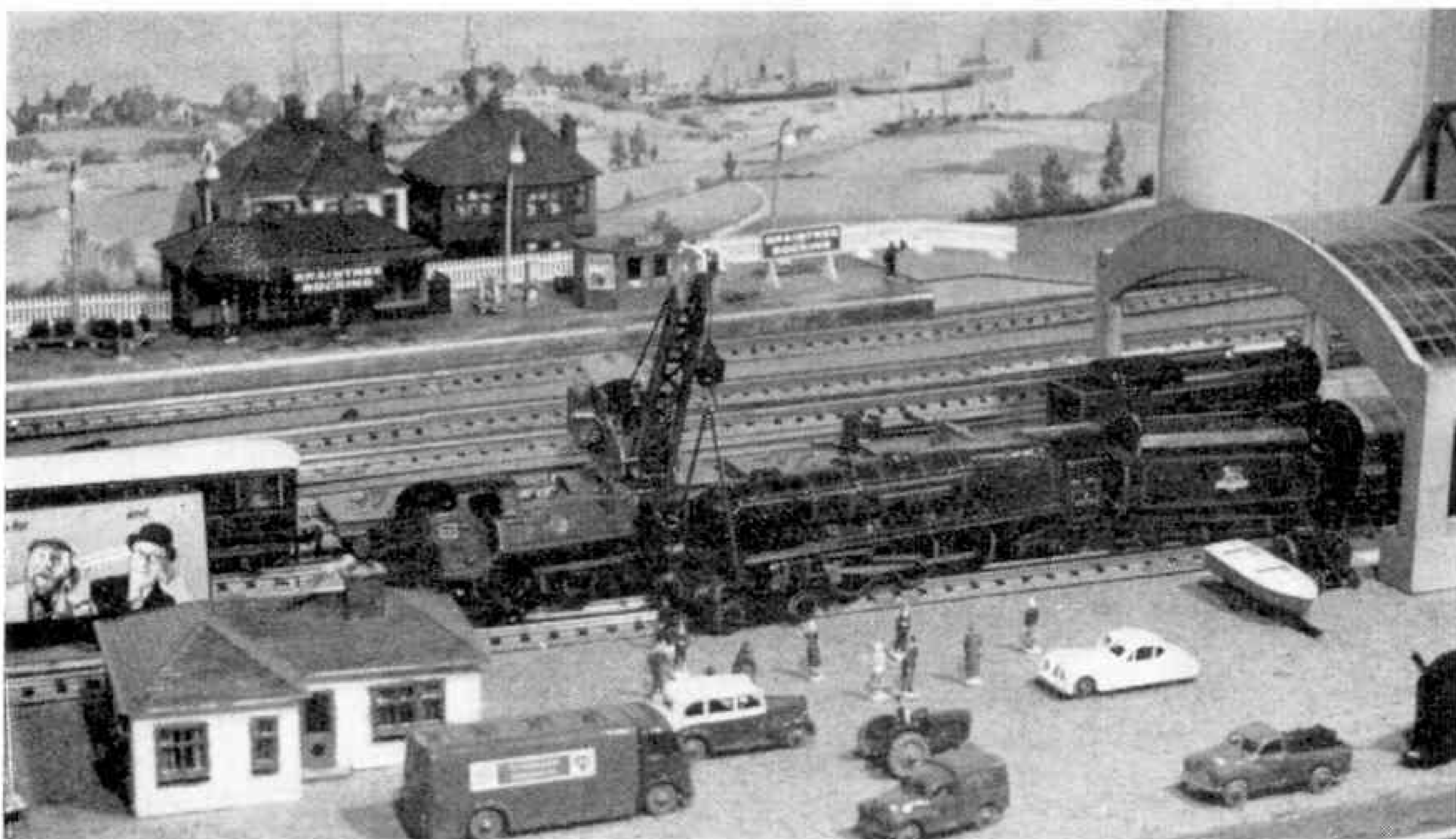
that you plan to make to your railways. So no doubt the pictures here will interest you, particularly those at the head of this page and the next, for these include several of the distinctly attractive Dublo Dinky Toys.

Probably most of you have several of these vehicles already in use, but the addition of another one or two need not present any great problem, even if you are away on holiday. The purchase of one or other of them is not likely to tax your holiday finances too severely. In any case I expect that Father will pay, as he usually does, and

Take your choice

There is plenty of choice, as you probably know, and you will be familiar with the various models shown in the two pictures referred to. All of them are perfectly suitable for general roadside use in the neighbourhood of the railway. Some are particularly suitable for standing outside your passenger station, such as No. 067 Austin Taxi, and No. 068 Royal Mail Van. Others are more specially suitable for use about the goods yard or depot, such as No. 063 Commer Van, No. 071 Volkswagen Delivery Van and No. 072 Bedford Articulated Flat Truck. You would be just as correct in using either of the two vans by your passenger station as well. They are just the thing for parcels traffic and the sort of things usually conveyed by passenger trains.

You have already heard about one of the more recent additions to this series, No. 076



Lansing Bagnall Tractor and Trailer, an excellent combination for your station platform. You can, of course, use it on the ground about your goods depot, if you wish. Don't forget that you can get a Trailer separately too, so you can assemble quite a long string of these vehicles behind a single Tractor.

A Breakdown Job

Although the illustration above shows the scene after a mishap, the collision that took place has provided a splendid opportunity for the use of the Hornby-Dublo Breakdown Crane. Our reader Richard Power, of Cheltenham, owner of the layout concerned, has the right idea. The rear coupled wheels of his "Duchess" are on the rails and he has photographed the lifting of the front end of the engine by means of a sling attached to the crane hook. What you can see of the breakdown train assembly is interesting too, because it includes

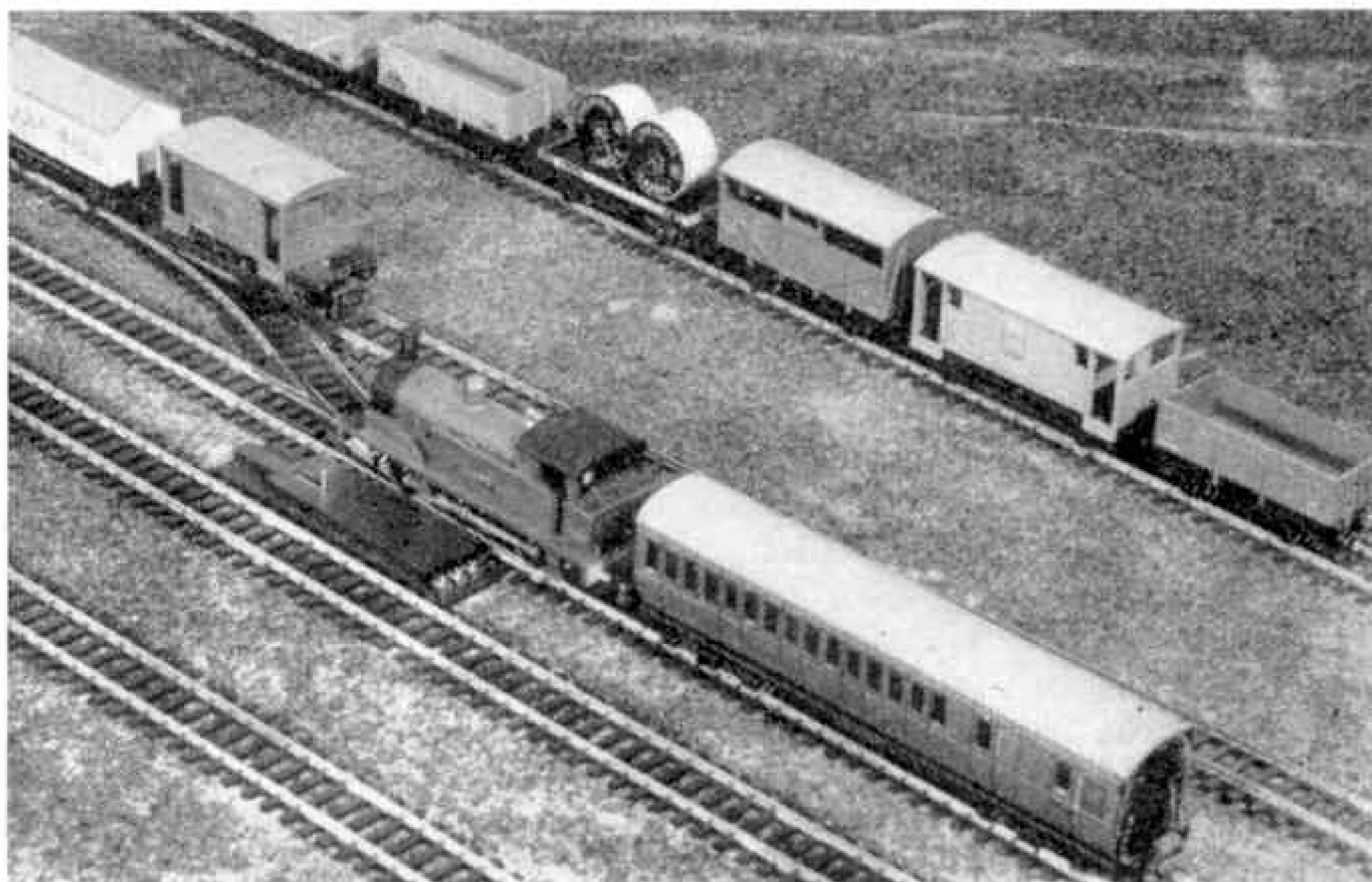
A push-pull or auto-train consisting of the Hornby-Dublo 0-6-0 Tank with a Brake 2nd Compartment Coach. The latter is being used to represent a driving trailer.

The Hornby-Dublo Breakdown Crane deals with a mishap on the layout of Richard Power, Cheltenham. The position of the derailed engines makes things difficult for the crane driver. Photograph by J. Price.

an obsolete Coach to represent the riding van for the breakdown gang.

The Push-Pull

In the Hornby-Dublo Two-Rail scene below is represented the sort of train you may well encounter on one of your holiday jaunts, a push-pull or auto-train. When the engine pushes the train, as the 0-6-0 Tank is doing in the picture, special arrangements enable the driver to manage the engine from what is normally the tail of the train.





The Hornby-Dublo layout built by Mr. A. Cooling, of Mosborough, for his sons Barry and Graeme, incorporates a model fairground in the centre. The railway is pictured out-of-doors on a fine summer day.

"Layout Man" writes about:

A Fairground and Other Layouts

THE first Hornby-Dublo railway that we visit, in pictures, this month is appropriately shown in an outdoor setting. Very suitably, as a subject for this holiday period, it incorporates a miniature fairground as its centre piece. The layout as a whole, both railway and fairground, provides plenty of entertainment for Barry and Graeme Cooling, of Mosborough, whose father, Mr. A. Cooling, has been responsible for building up this unusual model. For simplicity of erection the layout is arranged in two main sections. The portable character thus secured has made it possible to convey the railway to various functions where it has helped to raise money for various charities, a use on which the owners are to be congratulated.

An unusual feature

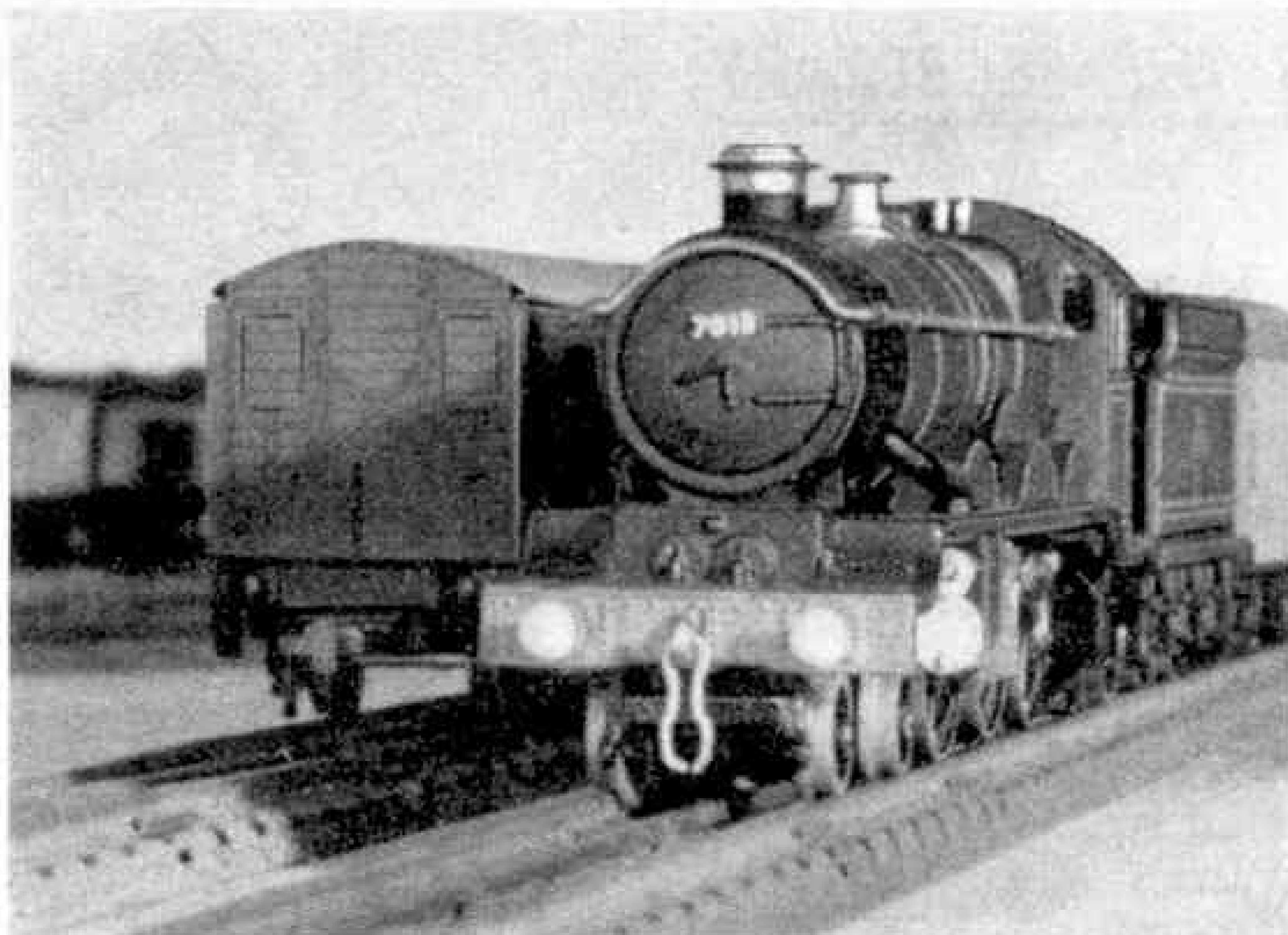
The railway itself is not complicated, but consists of a double track main line with various sidings, one of which you can see right at the front of the picture. There is one station, with a platform to each main track, and an unusual feature, for a model, is the fact that the station is crossed halfway along its length by a wide girder bridge that gives access to the fairground site. The two platforms are connected by means of a

standard Hornby-Dublo Footbridge clearly visible in the illustration. There are other bridges and lineside items including a two-bay locomotive shed, and at the end of the board furthest from the camera is a coaling plant. Sidings serve a miniature colliery which incorporates the representation of pithead gear, engine house and loading screens.

The railway, therefore, incorporates plenty of interest and a good selection of trains is run by various well-known locomotives of the Hornby-Dublo System such as *Duchess of Montrose*, *Bristol Castle* and *Silver King*, while the B.R. Standard 2-6-4 Tank is also represented. Incidentally, in the picture above, the 2-6-4 Tank has just left a Cattle Truck alongside the sheep pens, and is waiting for the express that is travelling through the station to pass along the main line, before it resumes its own journey.

All the fun of the fair

The fairground section consists of the usual sideshows, and stalls with working models of swingboats, galloping horses, animal roundabouts and a car roundabout, and a fairground engine. The motor house providing power for these models is built into the raised fairground platform, and



Fast freight is clearly an important traffic on the layout of Mr. J. Youden, Dover, where a "Bristol Castle" locomotive is here shown heading a train of this kind. Photograph by E. D. Long.

transmission and gearing are mainly Meccano Parts. When all models are in motion they move to the rhythm of fairground organ music, provided through an extension speaker under the fairground platform.

Now, we pass to a layout which is being installed on a fresh site as the result of moving house. This is the system developed by Mr. John Youden, of Dover, a Hornby-Dublo enthusiast who, with the impending removal well in mind, had been busy planning the present system for quite some time. When our correspondent forwarded notes on the layout to me, the new system had reached the stage of having all track screwed down in its new situation, but without buildings or other items.

Effective train running is already possible just the same; indeed, the layout has been evolved to make interesting train working

readily possible. Site restrictions prevent the inclusion of as much storage space as had been hoped for in the original design, but rolling stock out of use is stored ready to hand and can easily be put on to the track, as required, by means of the Hornby-Dublo Railer.

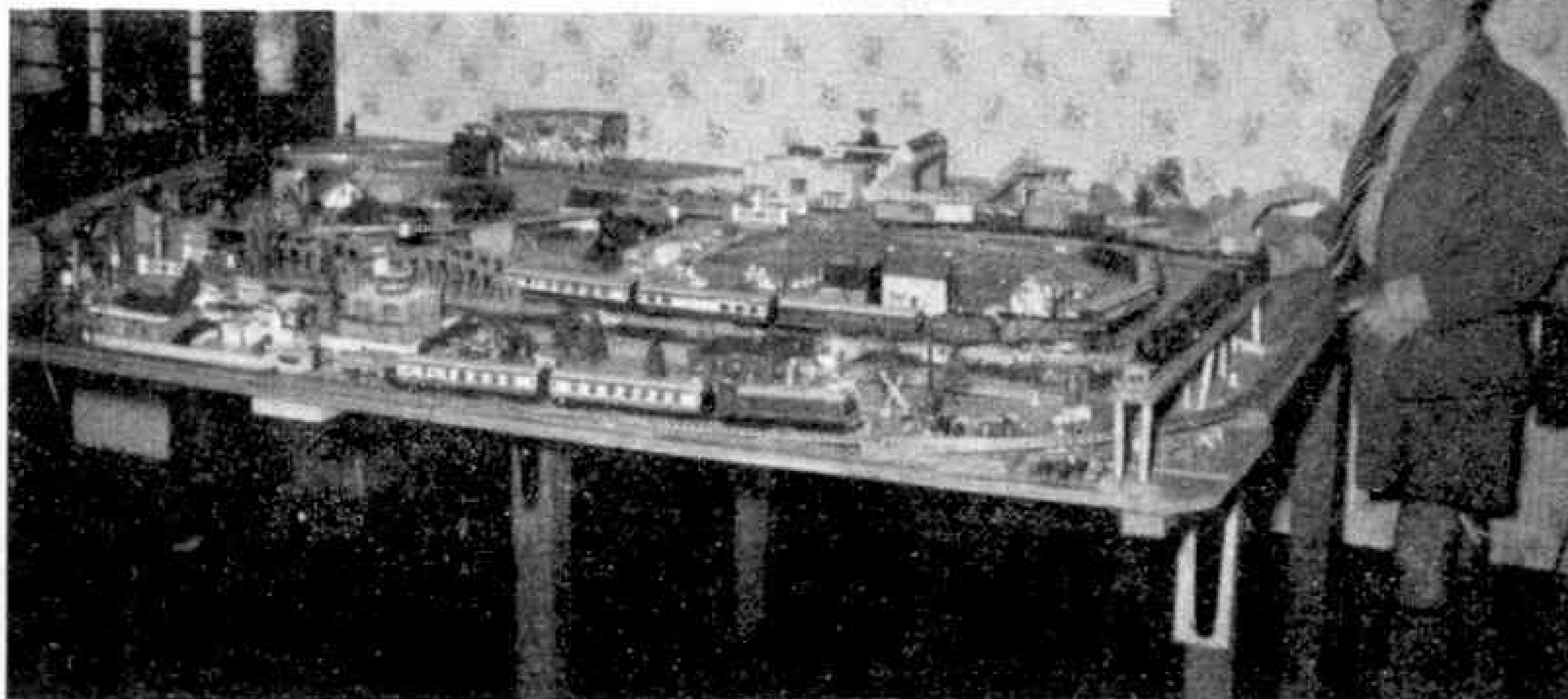
Good layout for traffic working

The layout fills a rectangular baseboard that is well framed up and supported, and the main line—which consists of double track—follows the usual so-called oval form. Crossover points connect the up and down main lines in three separate places and in conjunction with isolating sections make possible any amount of realistic traffic working. At the

site of the main station, provision is made for trains that are to stop by the use of platform loop lines outside the main running tracks. One loop, alongside the outer track, is extended well beyond the crossover points, the spurs thus formed being useful for holding rolling stock, or for accommodating locomotives as required.

Finally, we have below our reader Christopher Keeling Roberts, of Wem, busy with his layout which has recently been extended. You can distinguish the new planking supported by additional brackets in the foreground of the picture. This has made it possible to make the railway wider and Christopher has not been slow to take advantage of it.

Christopher Keeling Roberts, Wem, surveys the scene from one end of the baseboard supporting his Hornby-Dublo layout.





WITH THE SECRETARY



Club and Branch News

MAKE NOTES DURING YOUR VISITS

The summary on this page of the latest report from the Maylands M.C., in Western Australia, mentions a visit to the Government Printing Office. In his detailed account of this visit the Secretary, Warren Bransby, tells me that in the printing room he recognised one of the machines as the type which formed the subject of the Meccano "Model of the Month" for October 1955, and which he had built. He adds that further along the printing room the party saw another type of machine which they recognised as the subject of a model being built by member Roger Head.

These two incidents emphasise the value of Club visits to places of engineering interest. In this instance the members saw the prototypes of models which they had already built or were constructing, and I have no doubt that by the time the tour ended they had also seen much which will provide good material for their future model-building.

It is indeed important that when members take part in visits of this kind they should remember to equip themselves with

notebook and pencil, and be ever on the alert to make a few rapid notes and rough sketches for guidance when model-building next Winter.

CLUB NOTES

BORDEN GRAMMAR SCHOOL M.C.—Activities have centred round the Club model railway, for which members have been busy making cuttings, and a tunnel built up from a wooden frame covered with papier mache, and then painted. *Secretary:* C. Walker, 5 Woodstock Road, Sittingbourne, Kent.

AUSTRALIA

FREMANTLE M.C.—Weekly meetings have been held on Fridays. Model-building by the younger members has improved and they are now confidently tackling more ambitious subjects such as lorries, cranes, robots and bridges. Additional Meccano parts and equipment have been bought from Club funds. The Club was associated with the Maylands M.C. in putting on a fine models display at the Perth Homes and Industries Exhibition referred to on this page last month. The Club will have a good display of working models at the Festival of Fremantle later this year. *Secretary:* R. McPhee, 64 Allen Street, East Fremantle Western Australia.

MAYLANDS M.C.—Visits to several places of interest were organised during the school holiday period. The first visit was to the Government Printing Office, where members saw monotype and linotype machines in operation and were greatly interested in an envelope making machine. A visit to the Royal Mint was much enjoyed. There they were shown the various operations in the making of coins, beginning with the gold refining department and finishing with the inspection of newly made coins and the automatic counting of them into bags for the banks. The third visit was to Pope Products Ltd., a new factory in an area that was bush only a few years ago. At this works members saw refrigerators and a wide range of other electrical and household goods being made, and the visit concluded with the boys being treated to sandwiches,



Mr. C. Simonelli, who joined Mysore (India) M.C. in December 1958 as Co-Leader and in June last was appointed Leader. During the 18 months Mr. Simonelli has been associated with the Club his thorough knowledge of mechanics has been invaluable to the members, with whom he is very popular.



Part of the Meccano display at a recent Exhibition by the Ashted Free Church M.C., Ashted, Surrey. On the extreme left is Mr. Hawker, the Church Secretary, and on the table in the centre foreground is a Meccanograph which was operated by Clifford Price, the son of the Leader. The boy behind the Meccanograph notice is Michael Dennis. Another Club member, Graham King, is seen operating the Hornby-Dublo layout in the background.

cakes and soft drinks in the works canteen. The Leader invited members of the retiring Committee to a barbecue supper, after which there was a general discussion of Club affairs. *Secretary:* W. Bransby, 90 Crawford Road, Maylands, Western Australia.

NEW ZEALAND

CHRISTCHURCH M.C.—Fortnightly meetings have been held. Model-building this year is keener than ever, and the Club competitions held have spurred members on to a still higher standard of model-building. This was reflected in the very fine display of Meccano models that the Club staged at the New Zealand Industries Fair. The Fair lasted 17 days and, as always, was well attended. The Club display earned many favourable comments, and was also the subject of a 15 min. descriptive account over the air. Indoor sports have given variety to the Club programme, and a table tennis tournament was won by the Secretary. When not busy individually on separate models, the members are grouped into teams and this grouping also applies to some of the games activities, thus encouraging a spirit of friendly rivalry. *Secretary:* R. Boundy, 25 McBratneys Road, Dallington, Christchurch, N.Z.

NIGERIA

GINDIRI BOYS' SECONDARY SCHOOL—There was a one-week break at Easter,

when most of the Club members left for a camp about 18 miles from the school. Camp activities included football and Rugby, water polo, swimming, diving, and swimming under water. Other members went on a "Spartan" trip during which they travelled on a lorry to Jos, some 56 miles away from the school, and then trekked back through many villages and towns, with overnight stops at a few of them.

Model-building has been resumed, and under the guidance of the Leader and other senior members work has continued on the construction of the Meccano 4-4-0 Passenger Locomotive and Tender (Model 10.12) and the tipping Lorry (Model 5.1). *Secretary:* Mtaku G. Mshelia, Gindiri Boys' Secondary School, P.O. Barakin Ladi, Via Jos, N. Nigeria.

BRANCH NEWS

AVIARY MODEL RAILWAY CLUB (LEEDS)—During the summer months meetings are being held fortnightly. Outdoor activities have included cricket. On track nights one group of members operate the Gauge "O" layout and the other group the Gauge "OO" one. Modelling activities are devoted to the construction of miniature houses and 10-storey flats, which will make attractive additions to the layout scenery. *Secretary:* J. Baker, 10 Salisbury Terrace, Leeds 12.

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For Stamp Enthusiasts

Why Not Hungary?

By F. E. Metcalfe

Some time ago I received a letter from a lady, in London, who was born in France of Hungarian and French parents. She mentioned that she had only recently been attracted to stamps and had started off with



French issues because she had lived in France as a girl, and because the stamps were so beautiful. (I fully

agree with her). Then, having seen how wonderful are some of the designs of modern Hungarian stamps, she decided to go in for these as well, but as the cash she could afford to spend on a hobby was strictly limited, she wanted to know if I thought Hungarian stamps were worth collecting, and also where, in my view, she could buy the best and cheapest selections.

As she was living in London, I told her there were stamp shops galore in the centre of the city with competitive prices which would be more or less the same wherever she went. As for recommending the stamps, how could I do otherwise, if what she was looking for were really attractive stamps, at a low cost (referring of course to the moderns, for some of the earlier issues of Hungary, as is the case with many early stamps, are expensive). I also told her that I, too, liked Hungarian stamps, not only because they were beautifully designed, but because I knew Hungary well and was very fond of its people, many of whom I knew personally. Such a knowledge, of course,

does give one a leaning to things so bound up with a country as its postage stamps.

My correspondent also asked if I preferred used or mint. To that I replied that it was not what I liked, but what she preferred, although as it was the design of the stamps which mostly interested her, probably mint would suit her purpose better.

Later, I got another letter from her, thanking me for my reply, and stating that she had found shops with good stocks of Hungarian stamps. So reasonable were their prices that, even with the small amount of money she could spare for her collection, she had already got together quite a nice little collection. But there was just one snag; she wanted to know more about the stamps, and what their designs stood for, and did not know where to obtain the necessary information. I think she will overcome that difficulty, for not only is information generally available whenever a new set appears, but that old standby, the local reference library, will fill in many of the gaps.

I was very anxious to help, because I saw that here was a collector who was not satisfied with just sticking stamps in spaces, but one who would really get some benefit from collecting. As it is, far too many collectors merely look at the financial side of the hobby.

But to return to Hungarian stamps; the great point about them is that they depict the activities of a gifted people so well. The Hungarians are great musicians. Music is everywhere. You go into the smallest of restaurants and more likely than not you will find two or three gypsies playing with superb skill. I remember I was once asked by a friend to go with him to a competition for violinists. It was on

an ordinary working day, yet the big hall was packed with spectators holding their breath with excitement. (Continued on page 430)



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Stamp Gossip

WORLD REFUGEE YEAR

As stamps are issued by various postal administrations with the object of helping this good cause and that (not overlooking the exchequer of the Post Office itself) it was to be expected that stamp collectors would be asked to do their bit for World Refugee Year as collectors, apart from any help they might give as members of the public. So the whole world was asked to issue sets of stamps, and at the time of writing about seventy-five countries have responded. April 7 heralded the beginning of the avalanche. I am afraid that the British Commonwealth has been very backward, and to date only Ceylon, the Malayan Federation and Pakistan have responded. Our own Post Office has done no more than produce one slogan postmark, which had to be withdrawn smartly, and followed it up with another which could hardly have been more featureless. Anyhow these "W.R.Y." sets are taking on, and many are selling so fast that it seems likely that a very nice sum will result for a most worthy cause.

VALUATIONS

From time to time I get requests from people to value certain stamps, but I always have to refuse, as gently as I can. There are many reasons why such a refusal is necessary. In the first place, you cannot give even an approximate valuation without

seeing a stamp, and I am afraid I cannot undertake the responsibility of having stamps sent and seeing that they get back safely. This is one reason why no philatelic writer or catalogue editor will take on the job of valuation. Another point is this—what a stamp may

be roughly worth is one thing, but finding a buyer at that figure is another. In the end you may have to take a much lower price; then the party who gave the valuation, and the one who buys the stamp, will be in the "dog house". So if you have stamps you want valued, go to a stamp dealer and for a small fee he will give you some indication what they are worth. He may even be able to tell you where you can sell them. But don't build up high hopes because the stamps you have look old. Age has little or no connection with value, and it is only when stamps are rare that they bring big prices. It is unlikely that yours are in that category.

PHOSPHATES

Collectors of British Commonwealth stamps will know all about the Gilbert and Ellice Islands, and where they are situated etc., but I doubt whether the average

man in the street has that knowledge, or realises that a valuable product—phosphate—comes from these islands at the other side of the world.

Late last century (about 1897) a ship's officer, while ashore in Nauru, noticed a piece of rock of rather curious appearance. He took it with him to Sydney, and eventually it was used as a door-stop in an office.

One day an employee at the office where the rock

had found a home took an interest in it. While local geologists certified it as being nothing more than a piece of petrified wood, he was not satisfied and, after a further examination, it was found to be valuable phosphate. That began the search which ended in the finding of rich phosphate deposits in Ocean Island in 1900. This historic event is being commemorated by an issue of three stamps, one of which is illustrated here, that showing the actual piece of rock just referred to, and which was the beginning of the phosphate industry. The set has much to recommend it, for not only can it be bought for less than two shillings while current, but quite a nice little story can be

(Continued on next page)



Stamp Gossip—(Cont. from previous page)

written in your album when you mount them. All of which adds up to something of interest even to your non-collecting friends. Some may even know how valuable phosphate is to our food supply, even if they don't know where much of it comes from.

THIS YEAR'S WINNER

Many *Stamp Gossip* readers collect the special issues of the U.S.A. The fact that so many of these can be bought for a copper or two, and that their designs are often so interesting, is the reason for this popularity. Incidentally, the 1960 crop of these stamps will be nineteen, so there will be plenty of new ones to go for. But it is last year's emissions which I want to deal with now. Readers will remember that a competition is held annually in the United States to select the best design of the year. Last year more than 20,000 people sent in entries and the winning stamp was one showing the United States Flag. Would you have chosen that



one? Incidentally, the runner-up was the St. Lawrence Seaway issue. You will remember that Canada shared that stamp design which commemorated the opening by our Queen and the President of the United States of this passage, along which ocean-going ships can sail into the Great Lakes.

THE TIP OF THE MONTH

Short and sweet this month. Have you got those two nice little commemorative sets issued last year to mark the Cayman Islands and the Turks and Caicos Islands new Constitutions? Either set can still be bought at around the half crown mark, although they are now obsolete, and as time goes on they will rise quite a bit in price. Take care to keep your copies spotlessly clean, and if you mount them at all do so with good, peelable mounts.

For Stamp Enthusiasts

(Continued from page 427)

It was the same with opera. Budapest is not much larger than Liverpool or Manchester, yet the opera plays to packed houses most of the year, and when summer comes the company, instead of closing down, moves to Margaret Island in the middle of the Danube, to the open-air theatre, and there plays to bigger crowds than ever.

So it is, too, with sport; most football fans will remember how the Hungarian team came over to Wembley a few years ago. Not only did they beat Britain for the first time on her home ground, but they also exhibited a class of football which made our fans wonder what they had been watching up to then.

Now all these activities, as I have said, can be found depicted on Hungarian stamps, and if you start your collection from, say, the first post-war issues, you will find plenty of cheap



sets which will make a really magnificent display, particularly if you mount them neatly and fill in the details about the various designs which you will find in the catalogues.

Of course, many of the attractive stamps tell their own story. Take, for instance, the Nursery Rhymes issue of a few months ago. One of these is illustrated on page 427. All of us know the story of the "Three Bears" and the rest of the issue tells its own story, or rather various stories. It is not to be wondered at that this set was a best seller, for apart from the designs, the set was (and still is) quite cheap. That is a point I want to stress—the cheapness as well as the attractiveness of Magyar stamps.

There is one issue which will particularly appeal to young *M.M.* readers—an air set which appeared in 1954. It has to do with gliders, etc. and the 40f value shows a young Hungarian building a model glider. Winter sports, Olympic Games, trains, flora and fauna, all are depicted in some of the finest designs which have ever appeared on stamps.

So just take a look at your catalogue (you will find all you want to know in that fine Gibbons Simplified). But don't just buy a big packet of Hungarian stamps and stick them in a book. Select the sets you like and mount them with care, and write up the subjects shown.

Tunnelling Beneath the Thames—(Cont. from page 385)

The method of removing soil, or tunnel spoil, was another innovation. It was conveyed from the working faces to be screened of outsize material (stones, etc.), and was then mixed with water to form a slurry. This, pumped from the tunnel into settling ponds on the surface, is being used to form protective embankments around the tunnel entrances. Boring of the main tunnel was done by giant 300-ton circular shields. These were assembled in chambers reached from the 12-foot pilot tunnel built before the war. Each shield, with its cast steel cutting edges, was thrust forward by 40 hydraulic jacks exerting a total thrust of 5,000 tons, to cut a tunnel 31 feet 2 inches in external diameter. The total length of tunnel is 4,700 feet.

There will be three miles of approach roads, including a 1,000-foot long viaduct, linking with the London-Tilbury and London-Rochester roads. The tunnel has an internal diameter of 28 feet 2 inches and an inspection walk raised a little above and to one side of the 21-foot carriageway. Its lowest point is 108 feet below high water mark. Approximately 34,000 tons of cast iron segments, secured by 260,000 bolts, were used in the construction of the tunnel which is expected to be opened for traffic in 1962.

Road and Track—(Continued from page 391)

one of the most enjoyable to drive.

Vauxhalls recently loaned me a de luxe version, selling at £802 and very comfortable indeed with its real leather upholstery, floor carpets and well-finished interior trim. This car scores because it is compact. It might almost have been tailor-made for the narrow, congested roads of this country. With its 1½-litre power unit the Victor can be hustled along at 70 m.p.h. for mile after mile on M.1, and the top speed of 80 m.p.h. is not only easily reached but safely held. On the more normal type of winding British road it can be hurried along with a feeling of confidence that is fully justified. Driven hard, the Victor will give 25 m.p.g.; driven carefully the petrol consumption will be nearer 35 m.p.g., which is very good for a medium-size car that weighs nearly a ton.

The brakes are smooth and powerful, the roadholding and handling above average for a family saloon that was never intended for the sporting class, and the panoramic vision is quite exceptional. The steering is light, which makes for easy manoeuvrability and parking, and the three-speed gearbox has synchromesh on all gears. The steering column gear lever is one of the slickest and most precise I have used.

So much for the Vauxhall Victor. Economical, comfortable, safe and reliable it is a family car with a performance not far short of a sporting saloon, but with no vices. Ask Roy Salvadori what he thinks, and you will find him a great Victor fan.

America's Flying Coast Guards—(Cont. from page 388)

fly-ing-boats, which were operated from an air station at Morehead City, North Carolina, from March 24, 1920 until mid-1921. But it was not until 1925 that Coast Guard flying received any official support.

Some years earlier, the government had introduced prohibition laws to prevent the manufacture or sale of intoxicating drinks in the United States. This acted as an invitation for gangsters and smugglers to move in and supply drink that was often almost poisonous, and rum-running increased to such an extent that the ordinary Coast Guard cutters could not cope with it. A single Chance Vought UO-1 seaplane, borrowed from the Navy in 1925, did much to curtail rum-running in the area around Gloucester Harbour, Massachusetts. Congress finally provided sufficient money for five seaplanes and an air station was opened at Cape May, New Jersey.

Since then the aviation service has never looked back. By 1932 it had enough money to order aircraft specially equipped for Coast Guard duties. In 1934 it took over all Treasury Department flying activities; by 1940, it had a fleet of 50 aircraft and nine air stations.

Great Expansion

Then came the second world war, during which its commitments expanded so greatly that it needed 2,000 officers and 440 aircraft by 1945. In addition to their normal duties, these men and machines delivered 61 bombing attacks on enemy submarines, located about 1,000 survivors of ditched aircraft and torpedoed surface craft, and took part in the rescue of 95 of these.

Since 1956 the Coast Guard has been responsible for co-ordinating all U.S. air search and rescue work, by Air Force, Army, Navy and Marine aircraft as well as its own. Big Marlin flying-boats have been used for long-range operations. Now they are being joined by the six SC-130B Hercules which will halve the time taken to reach a search area.

It costs a lot of money to run such a service, but some jobs even show a profit in terms of hard cash. For example, one of the New Orleans helicopter crews recently discovered and smashed twelve illegal whisky stills, all busily turning out drink on which no taxes would have been paid, so defrauding the government of about £1,500 a day. Although not to be compared with the saving of 8,000 lives, this shows that by taking to the air the Coast Guards have lost none of their traditional skill in dealing with people who try to cheat the law.

An East Anglian Rail Tour—(Cont. from page 394)

Pullman car, with six-wheeled American-type bogies, which had been converted for engineering use.

The end of the trip was now almost at hand as the train drew out of Lowestoft and headed back towards Norwich, passing through Reedham, Cantley with its large sugar beet factory, and finally the Norwich Junctions, entering Thorpe Station on the opposite platform to that occupied by the 6.45 p.m. train to Liverpool Street, which many of the party had to catch.

So ended a memorable and enjoyable trip of 128½ miles. Those who had been fortunate enough to take part departed for their homes with the hope that the M. & G.N. Preservation Society will succeed in its cause, and that the railway it seeks to preserve will live on, at least in part, for many years.

The special train trip was well organised, and officials of British Railways and of the M. & G.N. Preservation Society are to be congratulated on its success.

Houses on the Move—(Continued from page 398)

beneath the building. With this completed, the house-moving machine backs round the dwelling and gradually takes the weight of the steel frame from the ground. Three winches are used, so that the lifting of the house from the old foundation, and the lowering at the end of the journey, can take place with the house perfectly level.

On the average, it took only a day to move a house. This meant that a family could have breakfast in their house in the morning, and supper in the house in its new position. At a demonstration, however, the house-movers, using the new machines, disconnected all services, moved the house and connected up all services within an hour.

Very little damage is caused by house-moving, for every care is taken to keep the house level. In the later stages of the job, householders have left crockery on the tables while moving was in progress.

It was also found possible to move the Anglican Christ Church from the small hamlet of Moulinette. With an age of 127 years, this was one of the oldest buildings along this stretch of the St. Lawrence. The church was supported, while on its original site, by a foundation of steel beams and then the whole jacked on to rubber-tyred trollies. It was then hauled to a new site in the Chrysler Memorial Park.

Easy Model Building—(Continued from page 405)

the two hammer heads should never strike the anvil at the same time.

Parts required to build the Mechanical Hammer:—4 of No. 2; 4 of No. 5; 4 of No. 10; 7 of No. 12; 2 of No. 16; 4 of No. 22; 1 of No. 23a; 1 of No. 24; 4 of No. 35; 29 of No. 37a; 25 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 4 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 1 Magic Motor.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE FORTRESS OF SHIVAJI

PRATAPGARH is an ancient fortress about 200 miles by road from Bombay. I shall always remember my first trip there when my parents and I were living at Mahableshwar, a hill station about nine miles from the old fortress. At one time the fort was accessible solely by steps, but now a newly-built road leads to it. My principal aim was to see the statue of Shivaji mounted on his horse—a statue unveiled in recent years by Pandit Nehru.

Rose to power

Shivaji was born in 1627 at Shivner, but was brought up by his mother at Poona. He was almost illiterate, but excelled at riding, shooting and wrestling. He was one of the Mahrattas, a pugnacious people, short and wiry, yet very sturdy. Shivaji in his early years became the leader of a band of young men and later rose to be a very powerful figure. Thus his memory is



The statue of Shivaji at Pratapgarh. Shivaji's upraised right arm holds his sword.

preserved to this day.

It is said that the King of Bijapur, alarmed at Shivaji's rise to power, sent a general named Afzul Khan against him. Shivaji pretended to be afraid and said he would submit to the Khan if he would meet him alone to discuss matters. The meeting took place near the fort. Shivaji had a dagger up his sleeve and in his hand he held the "vagh nakh" or tiger claws. As the form of greeting at that time was an embrace, Shivaji put his arms around his rival, into the back of whom he dug the fatal tiger claws, which are still preserved. Soon after this tragic encounter Shivaji himself met his death. Was he a Maharashtrian hero, or a murderer? This presents historians with a problem.

S. R. VATCHA (Bombay 26, India)



The river which proved the earth is round—This view was taken between Mepal and Welney on the Cambridge-Norfolk border, and shows part of the Old Bedford River which runs in a dead straight line for 21 miles. It was cut in 1630 by the then Earl of Bedford to divert the Ouse and drain the Fens, and here experiments were made to decide that the earth was not flat. Three boats were moored three miles apart and sites were taken with a telescope on projecting cross trees. Photograph by Reece Winstone, Bristol.



Fireside Fun

"Give me another bottle"
—I want to send a P.S.!"

"Is that the second gong?", the boarding house guest asked one of the maids.

"No," replied the maid, "that is the second ringing of the first gong: we have only one here."

* * * *

"Tom and I sure had fun at the beach last summer. First he'd bury me in the sand, then I'd bury him. This summer I'm going back to dig him up."

* * * *

"That man lives in a very small flat."

"Do you know him?"

"No."

"Then how can you tell?"

"His dog wags its tail up and down instead of sideways".

* * * *

"How was it possible for the prisoner to escape?", thundered the prison governor. "Weren't there guards at all the exits?", he asked the warders.

"Sure, sir," replied one who wasn't very bright. "It's possible the man may have slipped out through one of the entrances."

* * * *

The cannibal chief was stressing that his principles were human and kindly. "My main concern is to serve my fellow man," he insisted.

* * * *

The recruits were taking part in their first manoeuvres. One group was told to put the local railway station out of commission so that it could be no longer used. They were back within an hour, proudly stating, "The railway station can no longer be used."

"Ah, did you blow it up?", questioned one of the training officers.

"No sir," said the group leader, pointing to a large sack. "We simply took all the tickets."

"Gentlemen," announced the big-shot film producer, "if the public's tired of masterpieces, then we've got to give them something better!"

* * * *

BRAIN TEASER

The Miller and His Sacks

A miller has nine sacks of flour each bearing a number. He arranged them as shown in the sketch. The number on the upper pair, 28, when multiplied by the number on the single sack above, 7, gives the number on the three sacks in the centre—that is 196.

But this is not the case with the product of the numbers on the single sack at the bottom and the pair of sacks above it.

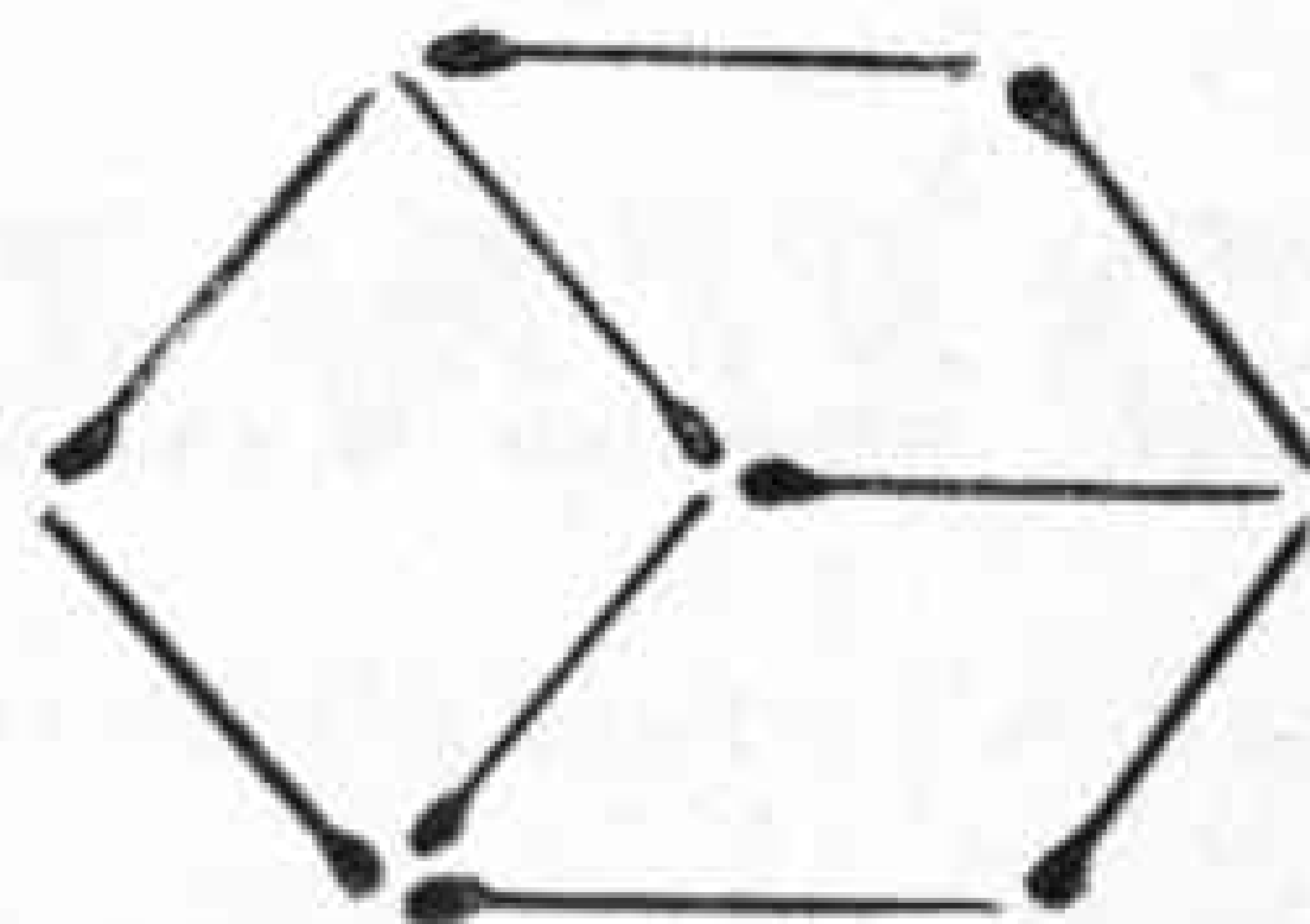
Can you change the positions of the sacks in as few moves as possible so that the number on each pair when multiplied by that on its single neighbour gives the number in the middle?

* * *

Answer to Last Month's Brain Teaser.

A Puzzle with Matches

The solution to this interesting match puzzle is shown in the sketch above.





HOW
TIMES



HAVE CHANGED

While Henry VIII of England and Francis I of France were discussing politics at the fabulous Field of the Cloth of Gold in June, 1520, many of their courtiers preferred more light-hearted activities such as Royal or Court Tennis.

Rules and equipment, of course, we would hardly recognize in these modern times. The 'racquette' was triangular and was strung diagonally with the most primitive animal gut. Many calls of "Fault" were, no doubt, directed at the maker rather than at the players. This is not so today, for Dunlop have successfully developed a range of tennis rackets which many of the world's leading players are proud to use.

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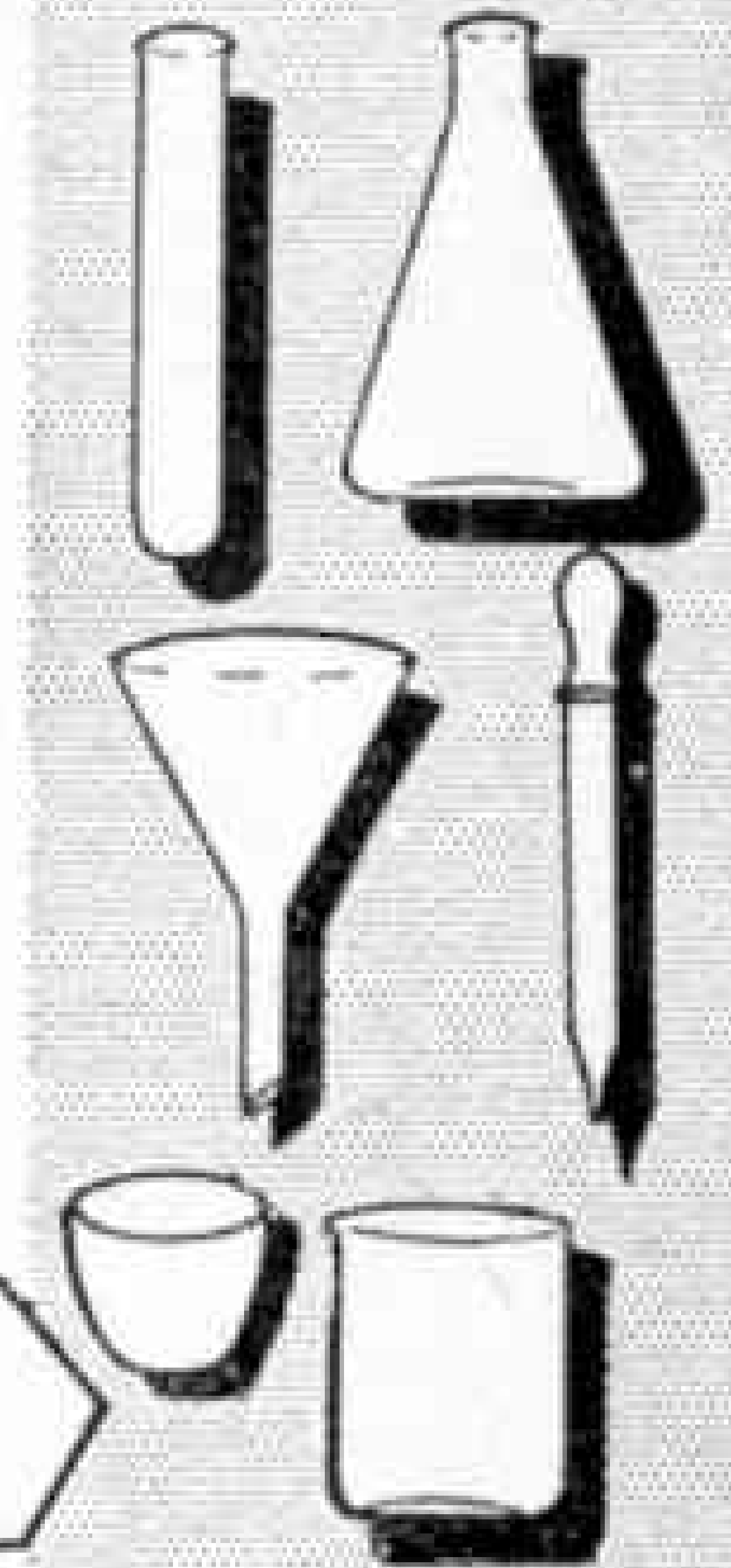
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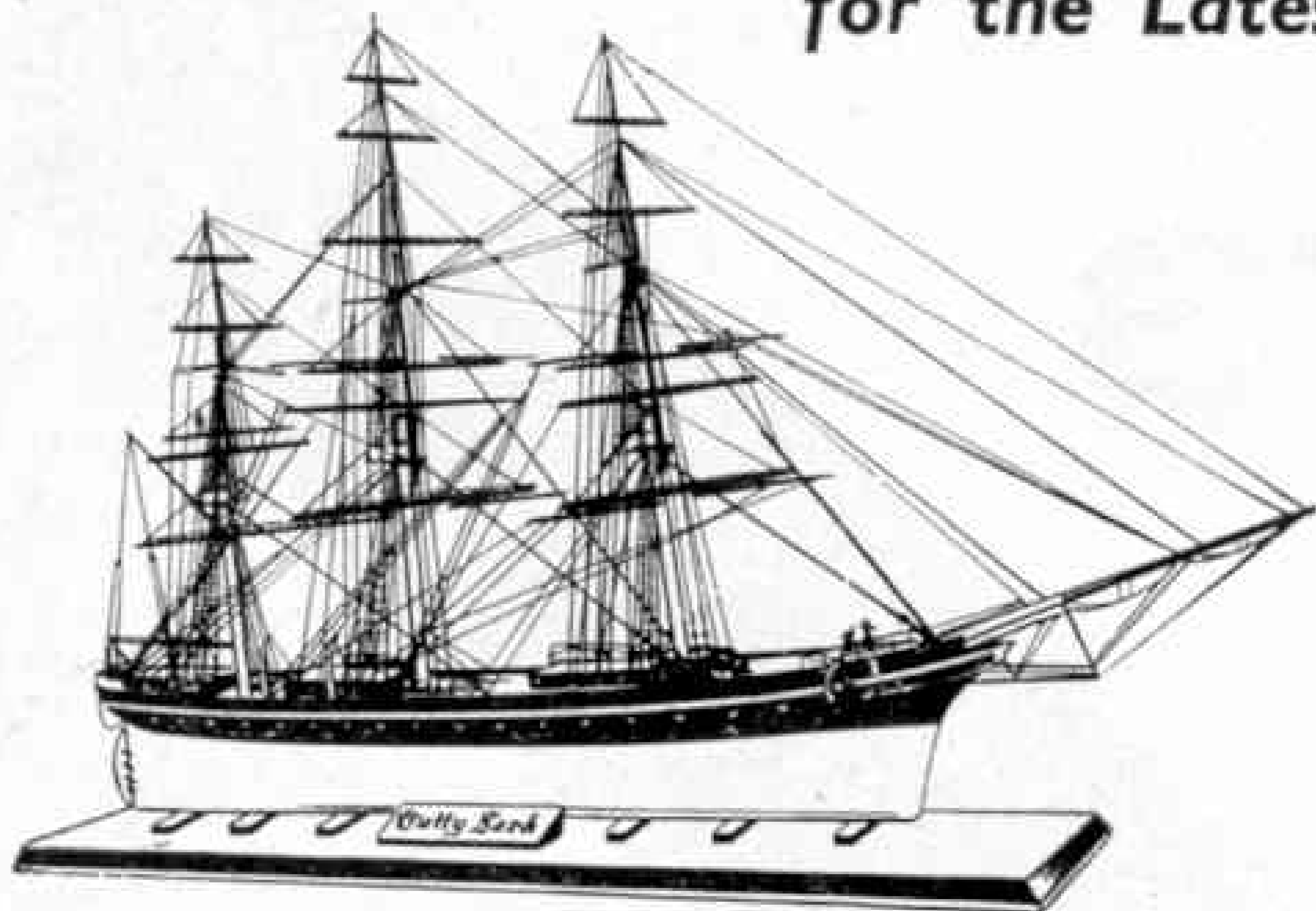
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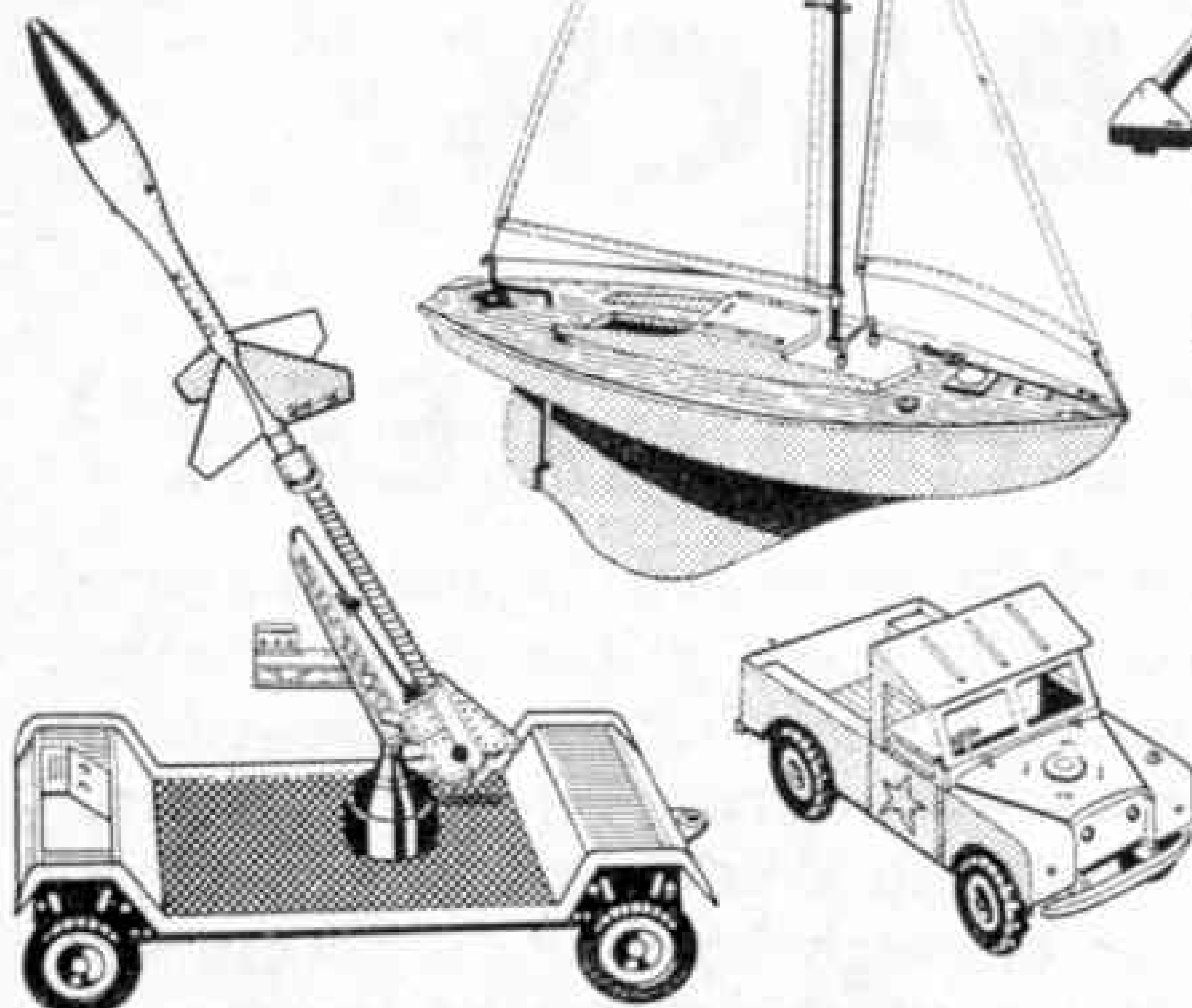
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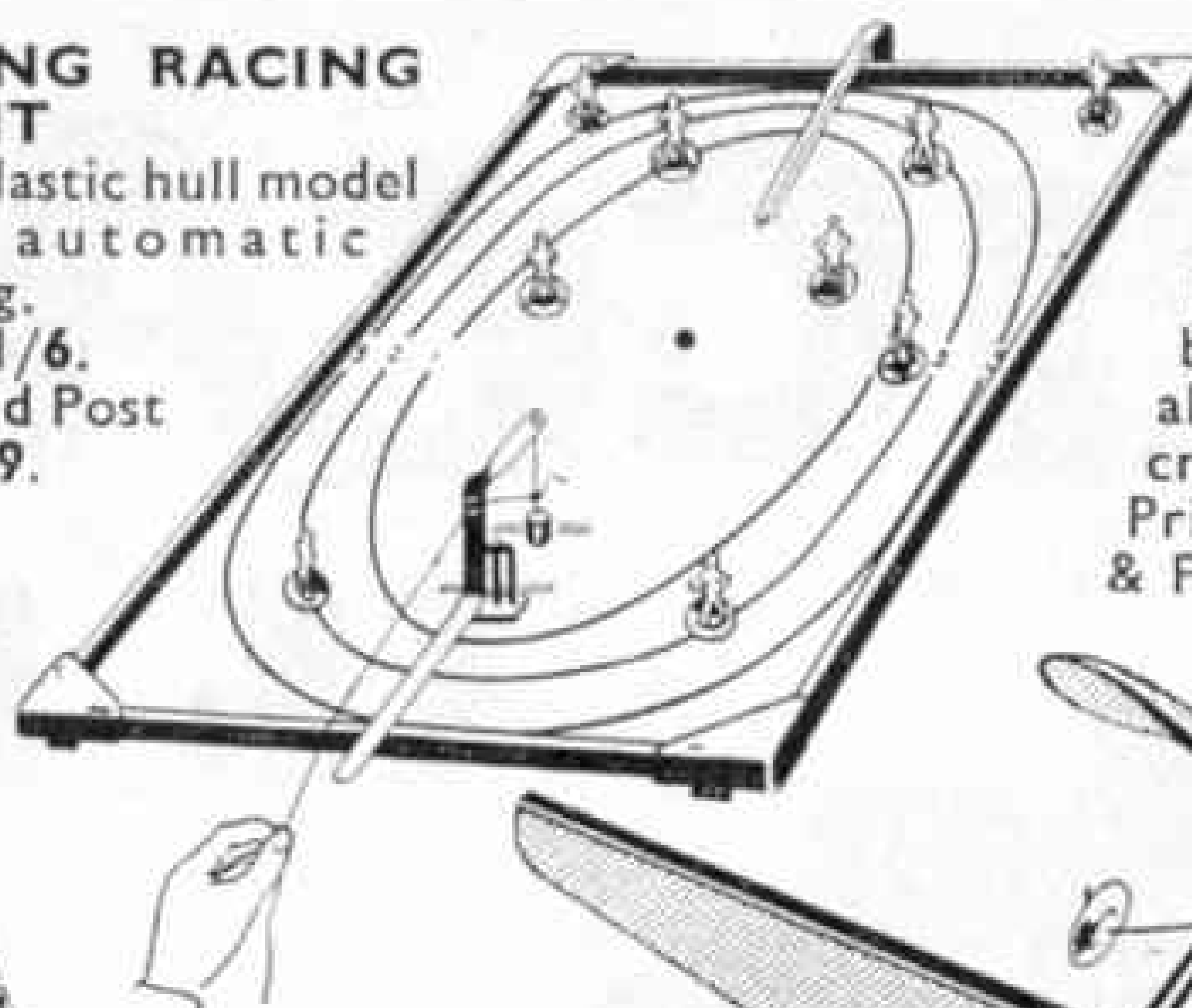
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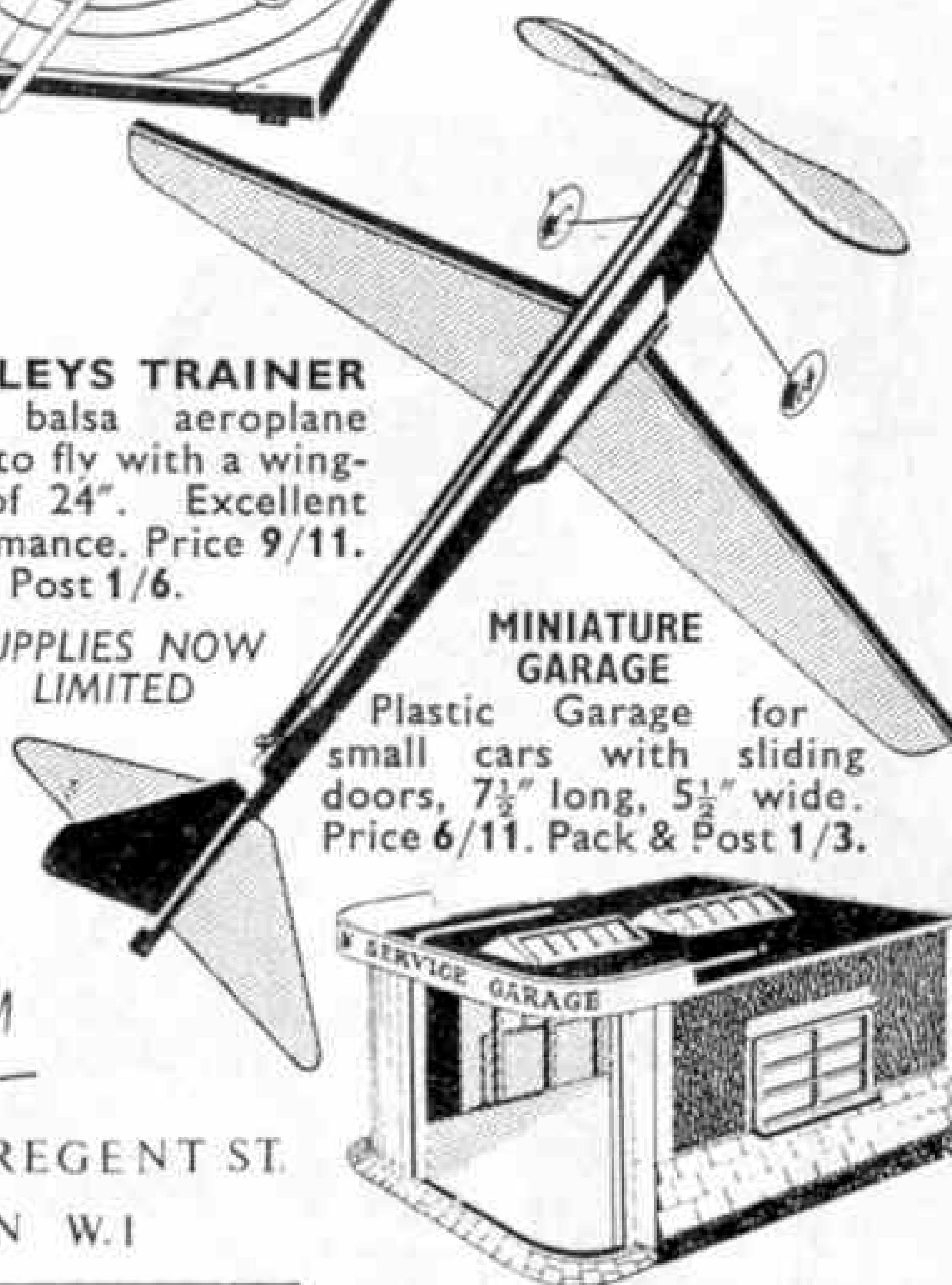
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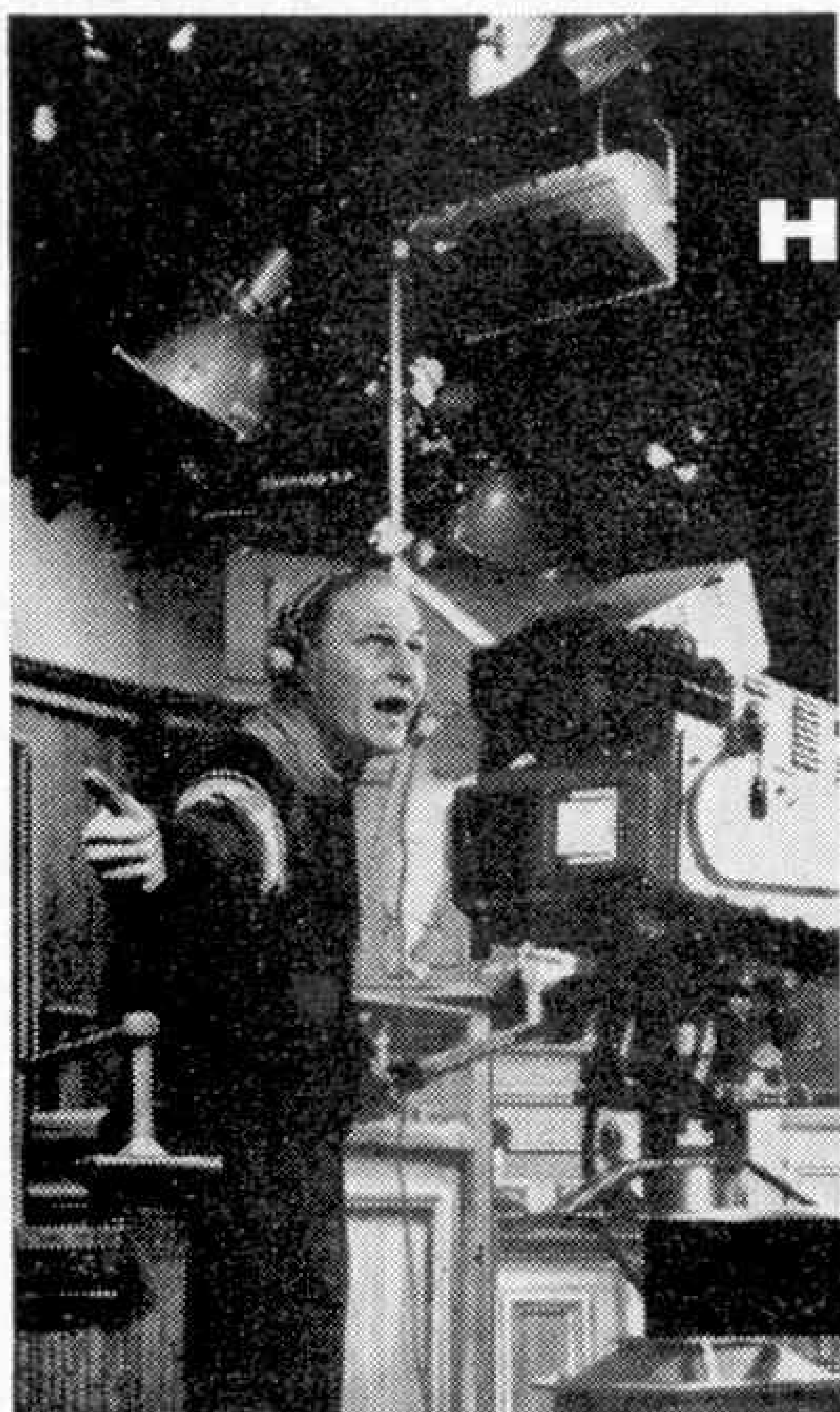


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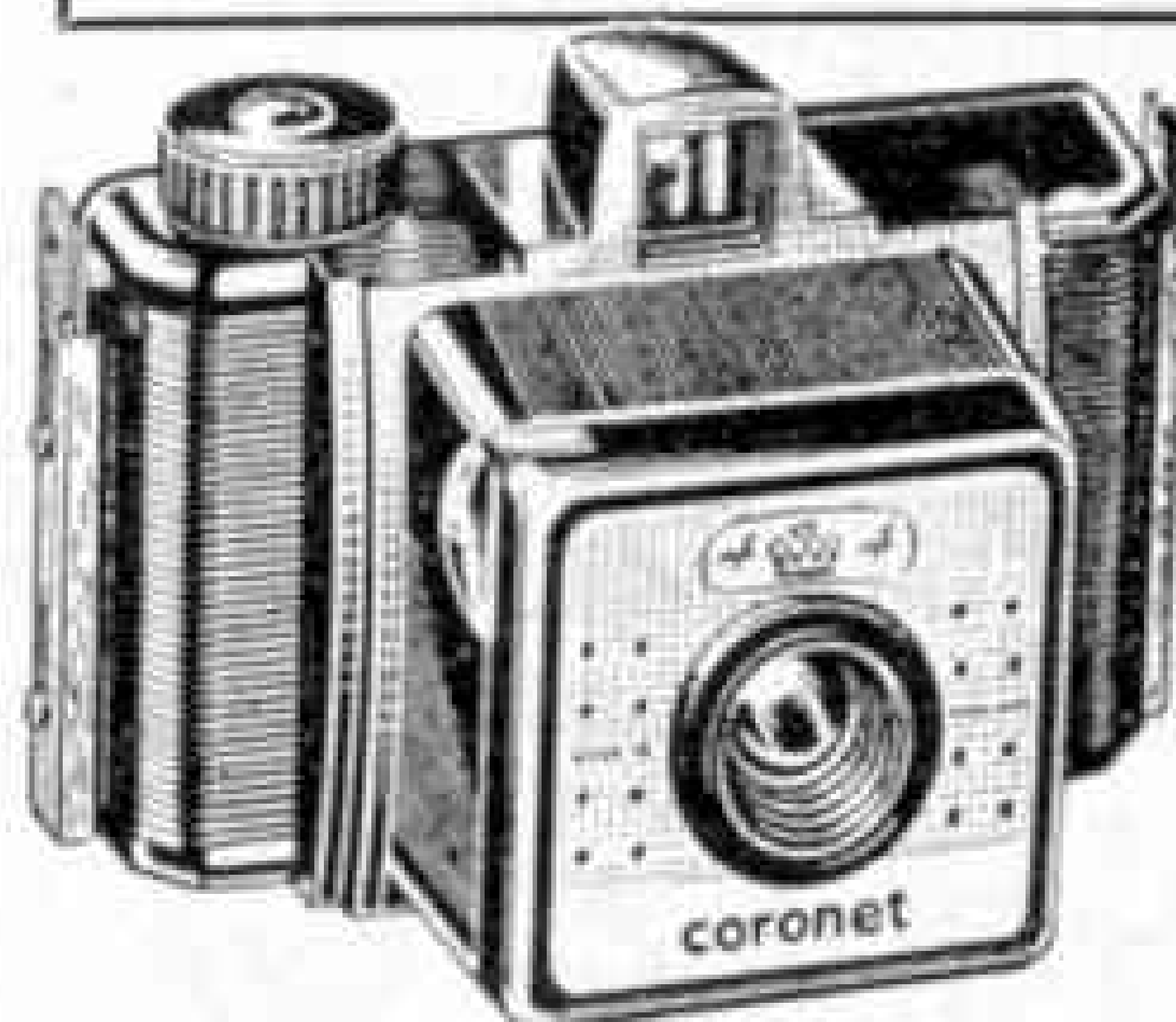
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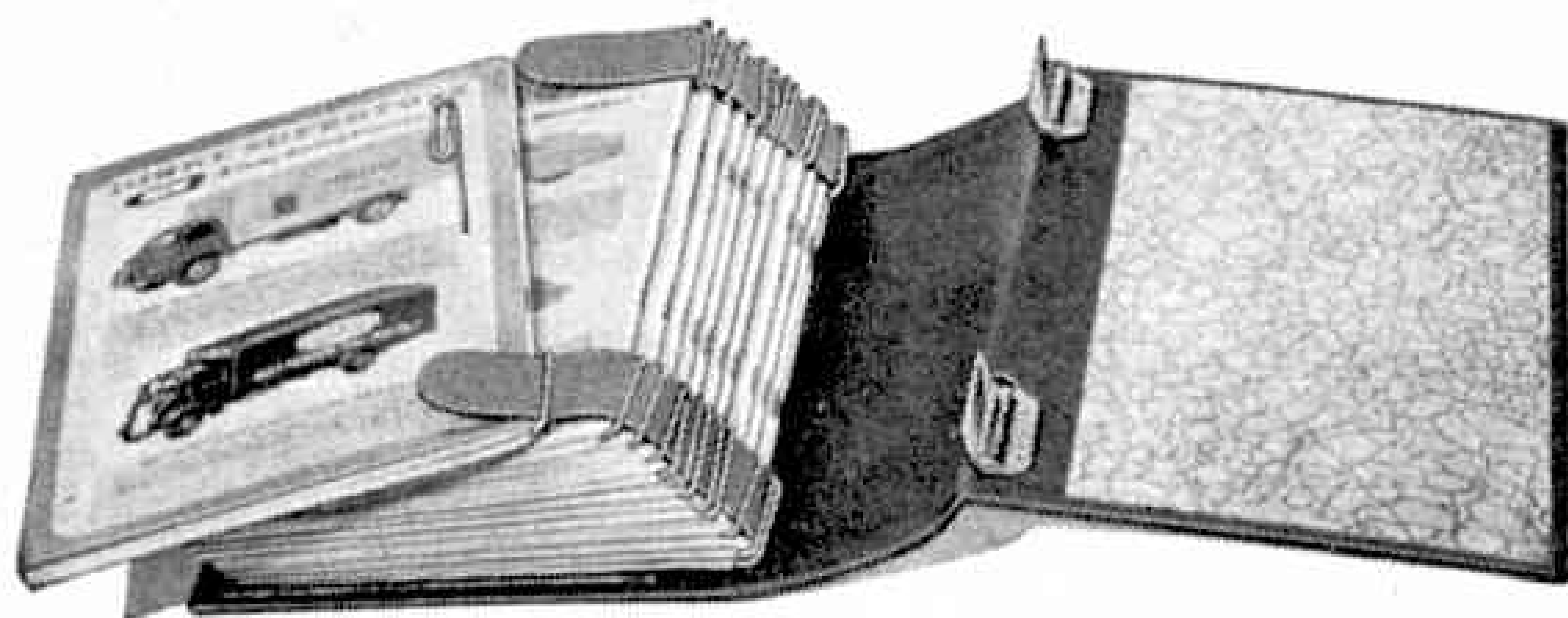


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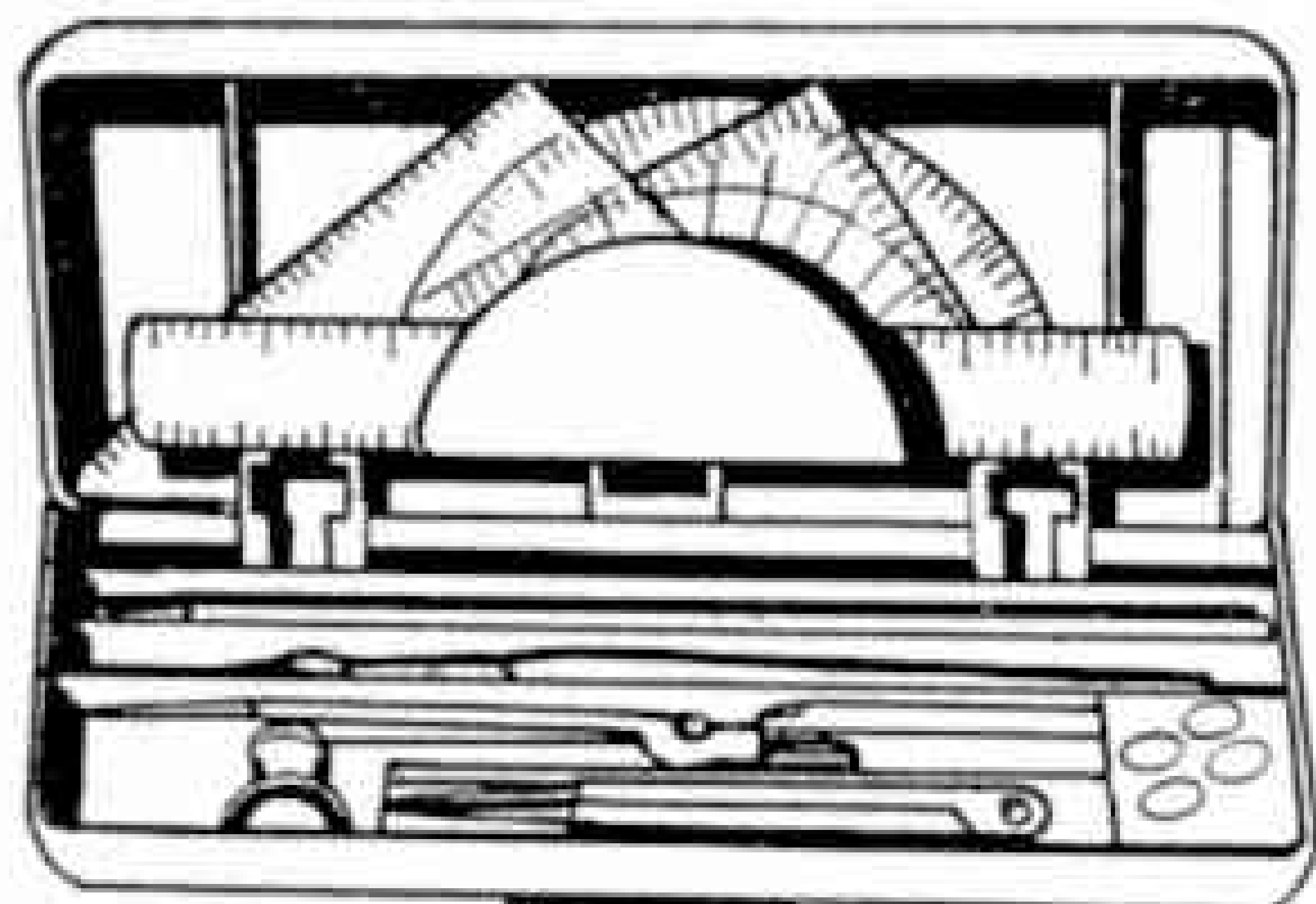
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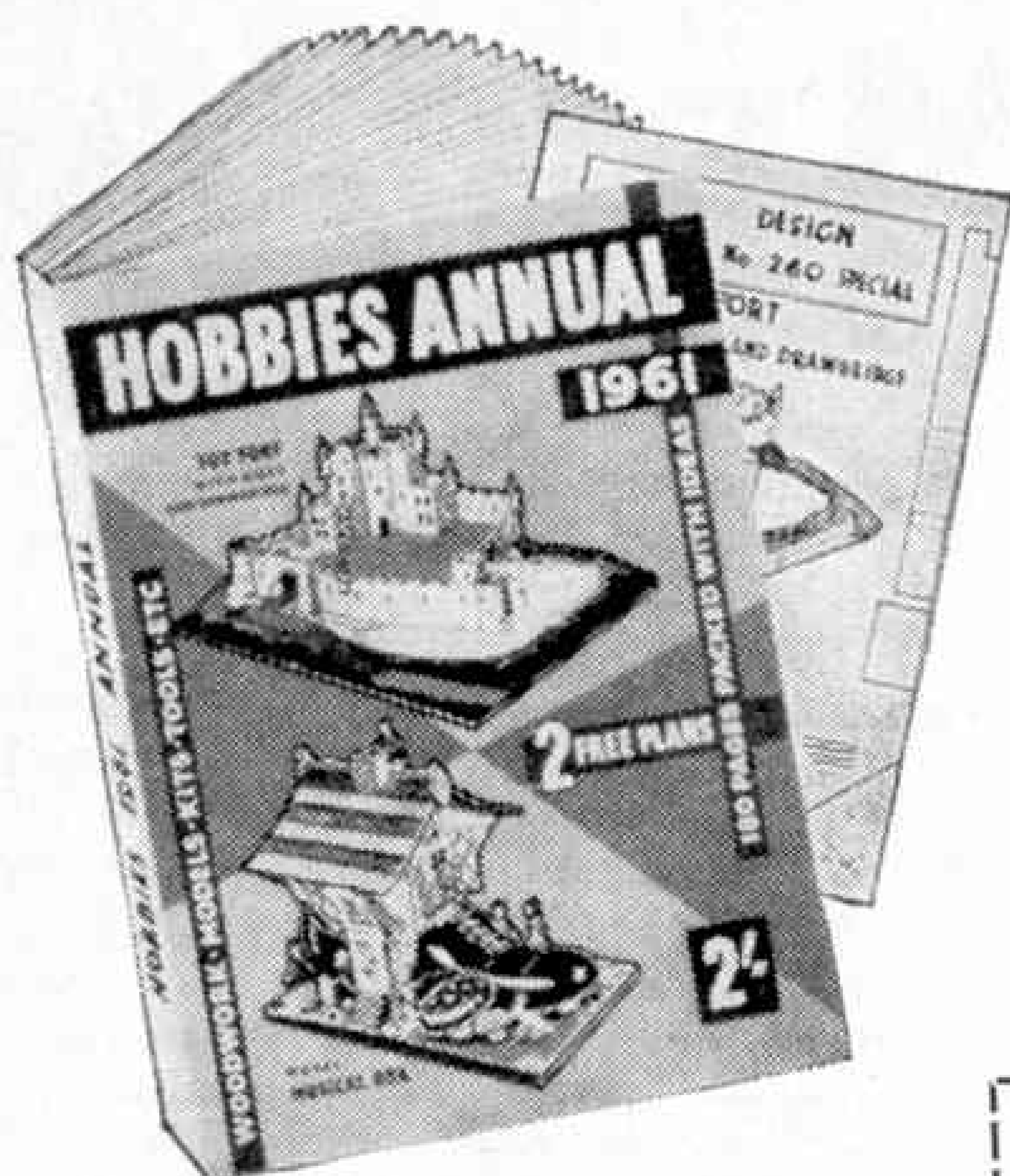
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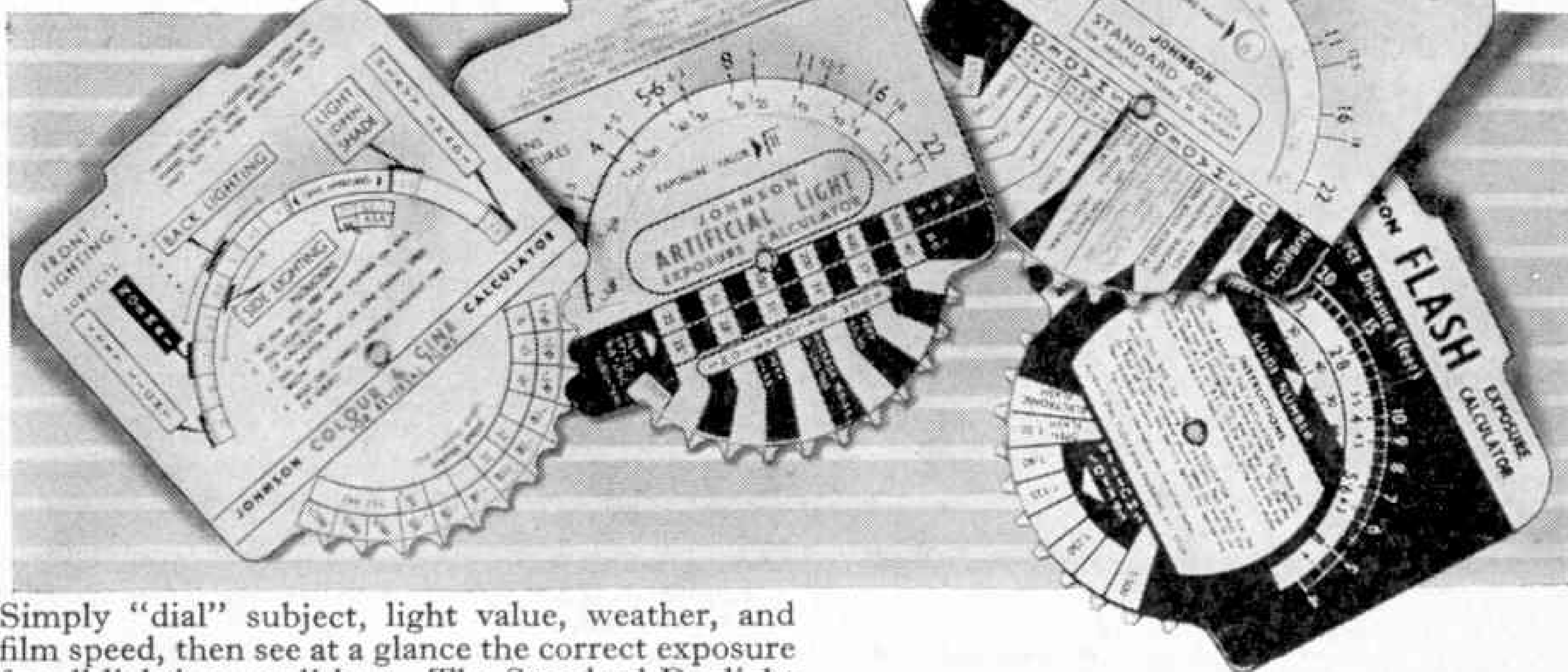
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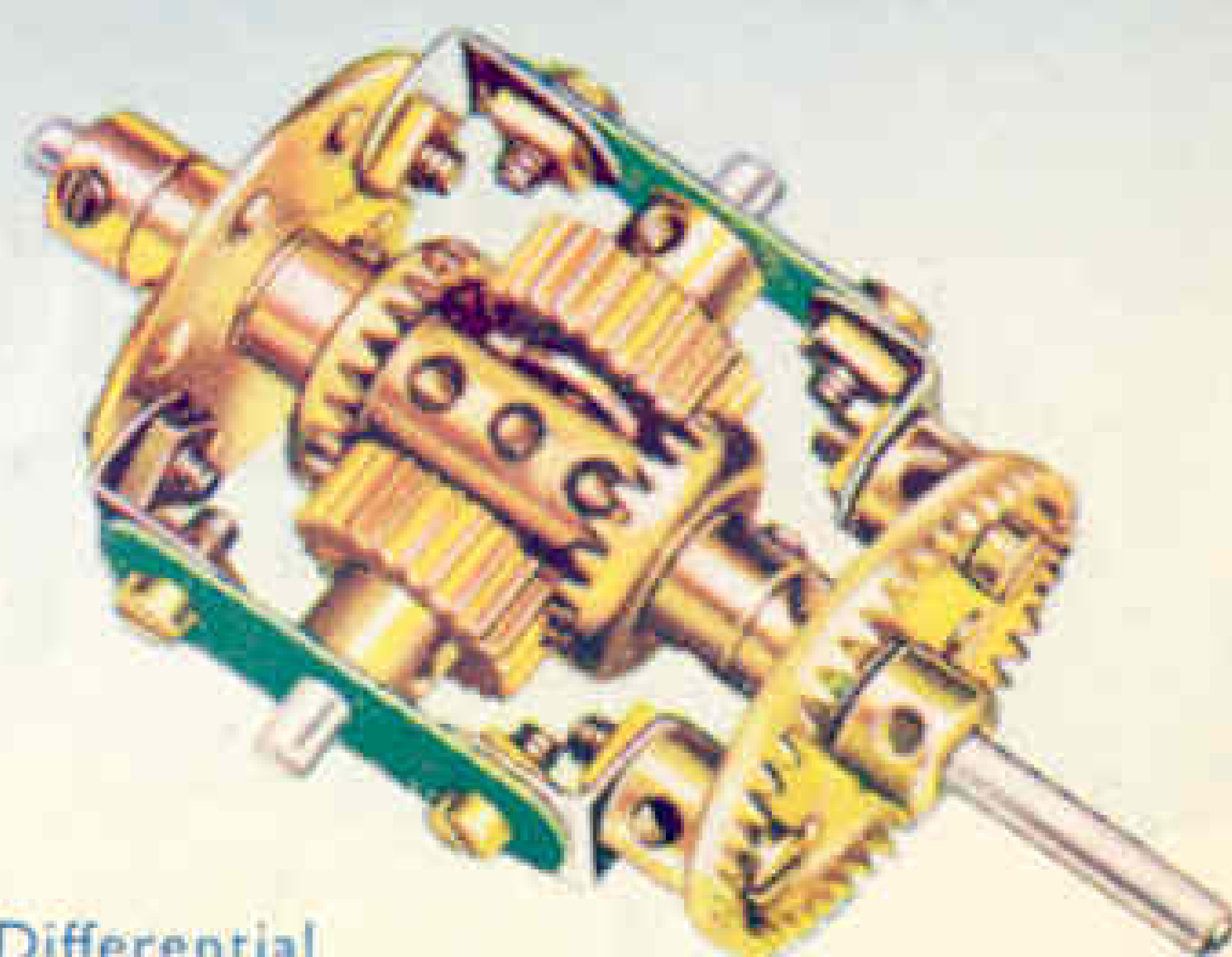
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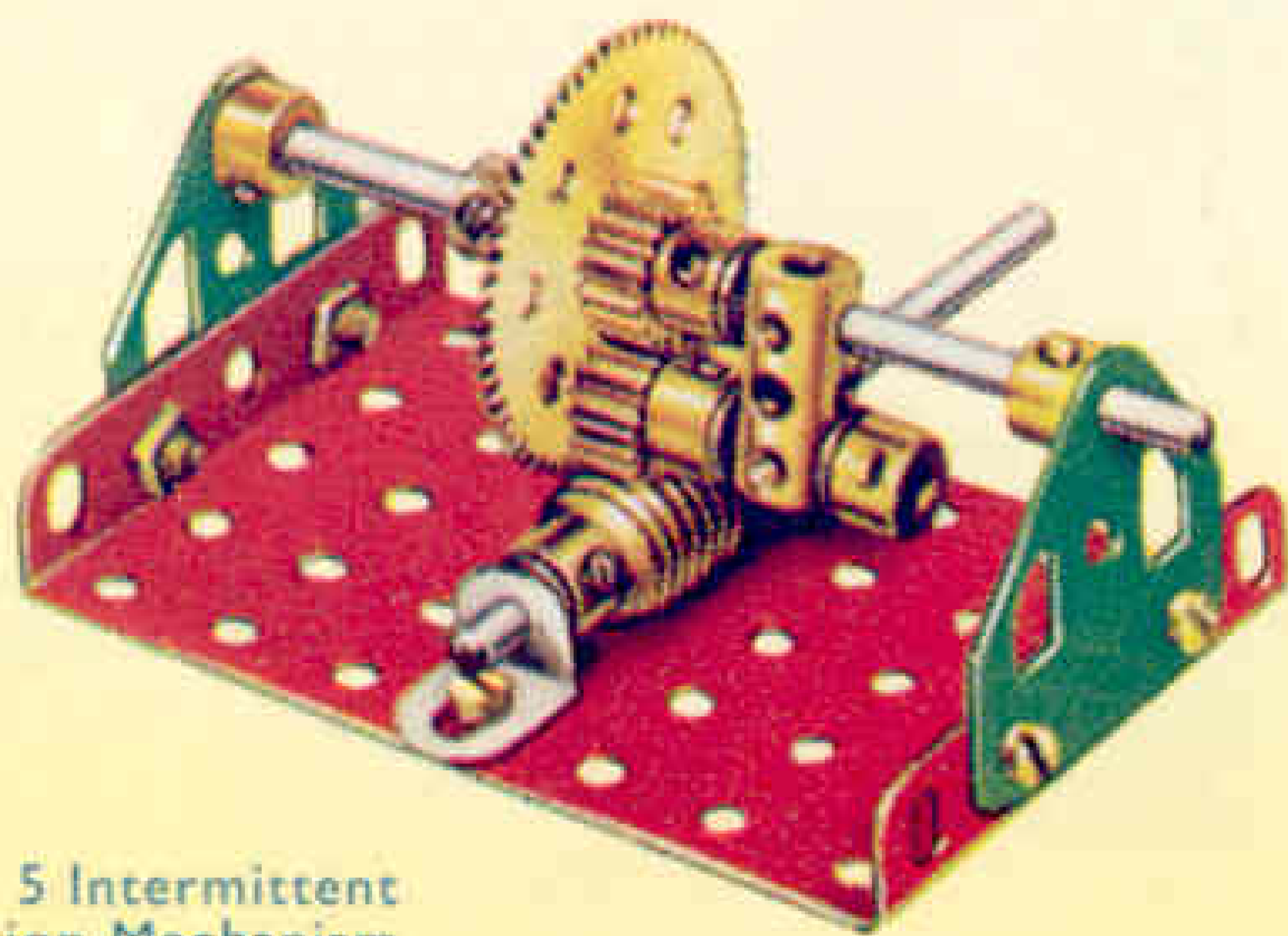


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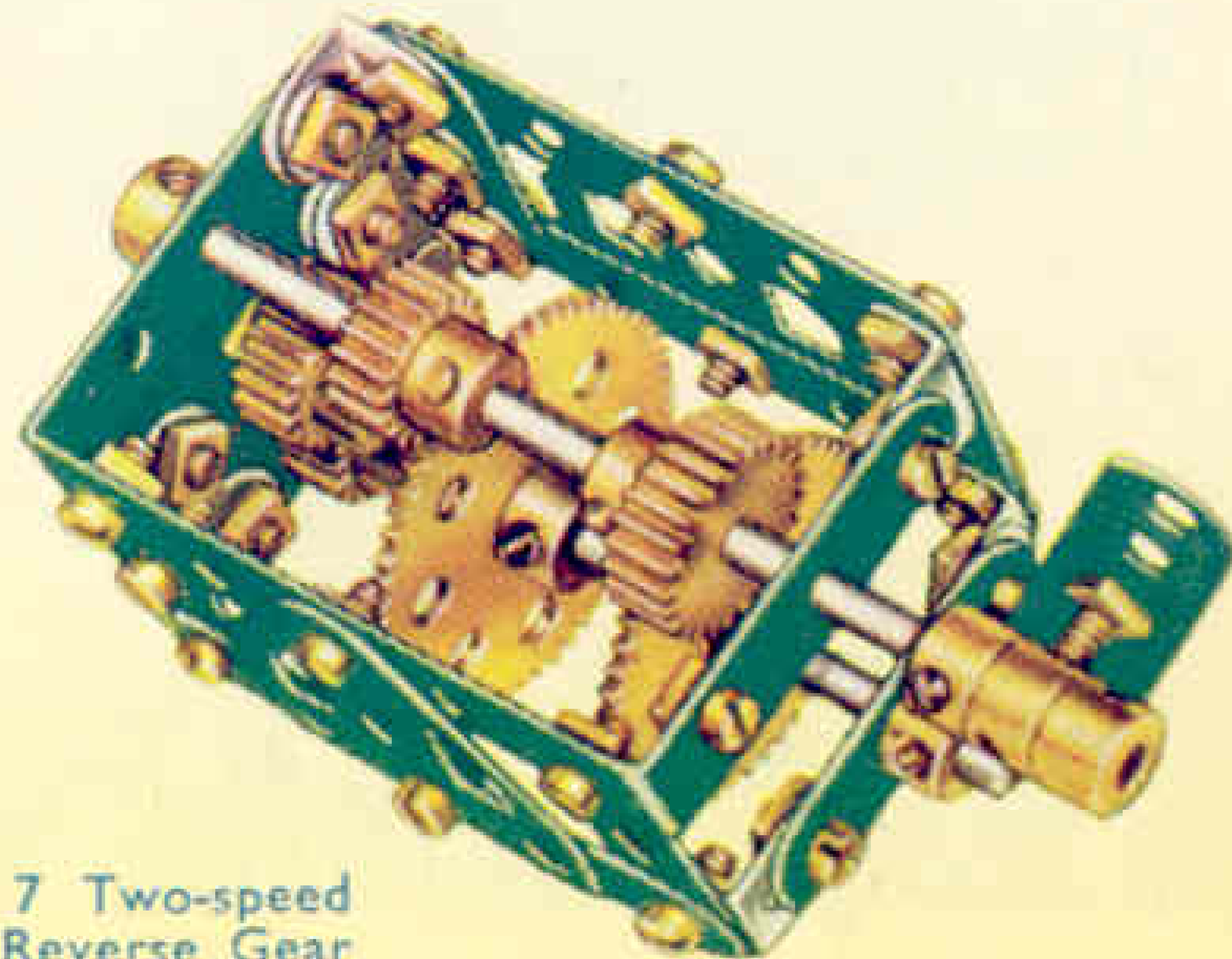
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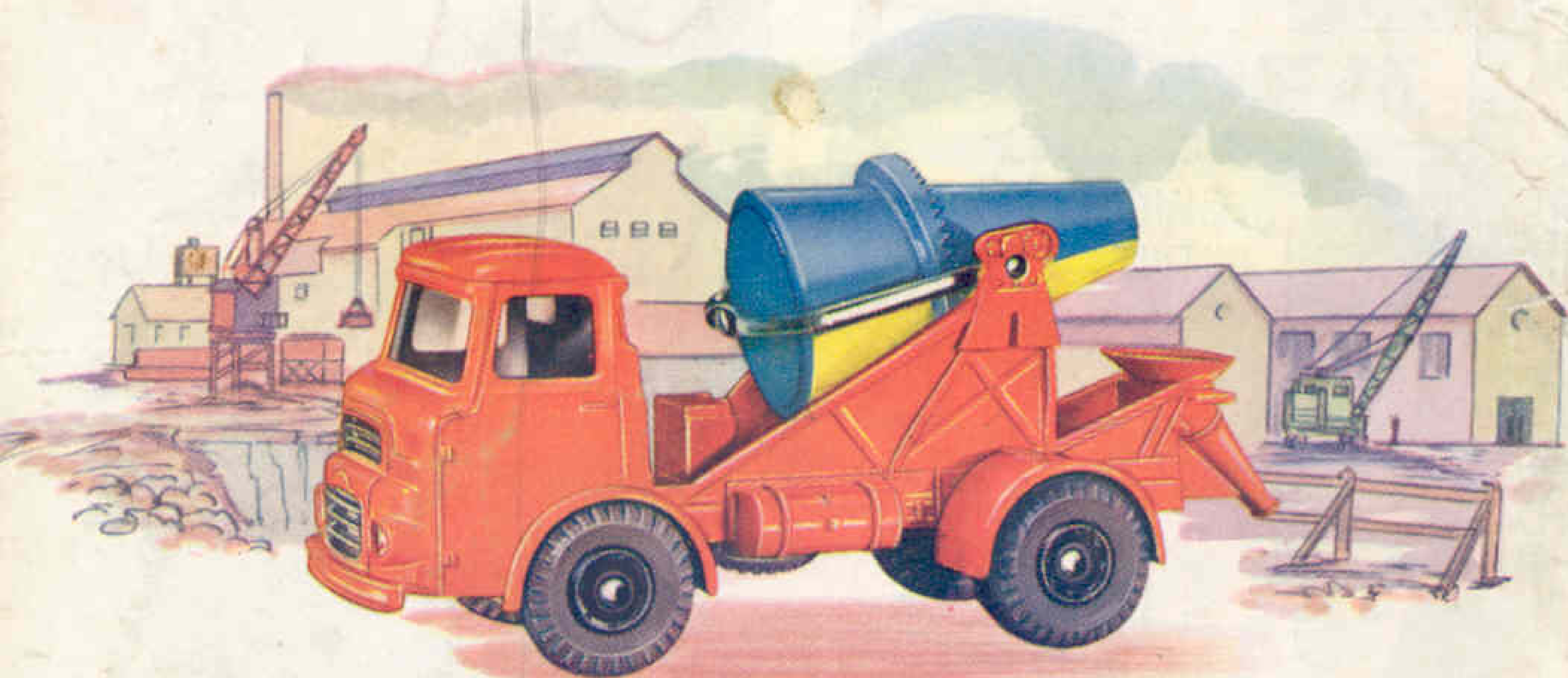
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